WORKING GROUP ON NORTH ATLANTIC SALMON (WGNAS)

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Contents

i Executive summary

WGNAS met to consider questions posed to ICES by the North Atlantic Salmon Conservation Organisation (NASCO).

The terms of reference were addressed by reviewing working documents prepared prior to the meeting as well as development of analyses, documents and text during the meeting.

The report is presented in five sections, structured to the terms of reference. Sections include:

Introduction;
Catches and farming;
The status of stocks in the Northeast Atlantic Commission area;
The status of stocks in the North American Commission area;
The status of stocks in the West Greenland Commission area.

In summary of the findings of the Working Group on North Atlantic Salmon:

- In the North Atlantic, exploitation rates on Atlantic salmon continue to be among the lowest in the time-series.
- Nominal catch in 2019 was 868 t. This was 179 t below the updated catch for 2018 (1047 t) and 294 t and 437 t less than the previous five and ten year means, respectively.
- The provisional estimate of farmed Atlantic salmon production in the North Atlantic area for 2019 was 1750 kt; production of farmed Atlantic salmon in this area has been over one million tonnes since 2009 and in 2019 provisional worldwide production of 2504 kt was almost 3000 times the catch of wild Atlantic salmon.
- Specific for the NEAC area, exploitation rates on NEAC stocks continue to decline and catches in 2019 were 743 t. This was 217 t below the updated catch for 2018 (960 t) and 26% and 35% below the previous five-year and ten-year means respectively. Northern NEAC stock complexes, prior to the commencement of distant-water fisheries, were considered to be at full reproductive capacity. The southern NEAC stock complexes however, were considered to be suffering reduced reproductive capacity.
- Specific for the NAC area, the 2019 provisional harvest in Canada was 94 t, approximately 19% higher than the finalized 2018 harvest of 78 t and the second lowest in the time-series since 1960. The majority of harvest fisheries on NAC stocks were directed toward small salmon. In recreational fisheries, large salmon could only be retained on 16 rivers in Québec.
- In 2019, 2SW returns to rivers for all regions of NAC were suffering reduced reproductive capacity.
- The continued low and declining abundance of salmon stocks across North America, despite significant fishery reductions, strengthens the conclusions that factors acting on survival in the first and second years at sea, at both local and broad ocean scales are constraining abundance of Atlantic salmon.

In Greenland, a total catch of 29.8 t was reported for 2019 compared to 39.9 t in 2018. North American origin salmon comprised 71.5% of the sampled catch.

ii Expert group information

Expert group name	Working Group on North Atlantic Salmon (WGNAS)
Expert group cycle	Annual
Year cycle started	2020
Reporting year in cycle	1/1
Chair	Martha Robertson, Canada
Meeting venue and dates	24 March–02 April 2020, by Web Conference, (33 participants)

1 Introduction

1.1 Main tasks

At its 2019 Statutory Meeting, ICES resolved (C. Res. **2019**/2/ACOM17) that the **Working Group on North Atlantic Salmon** [WGNAS] (chaired by Martha Robertson, Canada) will meet in Copenhagen, Denmark, 24 March–2 April 2020. Due to the coronavirus disease (COVID-19) the working group met via web conference to address questions posed to ICES by the North Atlantic Salmon Conservation Organisation (NASCO).

The terms of reference were subsequently modified to streamline the workload of WGNAS and to focus the work on supporting the advice deliverables for NASCO. The terms of reference were met.

The sections of the report which provide the answers to the questions posed by NASCO, are identified below. Note that questions 1.5 and 1.6 were removed in the revision of the WGNAS 2020 Terms of Reference. They are included here as a reference for record keeping only.

Question		Section
	Posed by NASCO	
1	**With respect to Atlantic salmon in the North Atlantic area:**	Section 2
1.1	provide an overview of salmon catches and landings by country, including unreported catches and catch and release, and production of farmed and ranched Atlantic salmon in 2019[1];	2.1, 2.2 and Annex 4
1.2	report on significant new or emerging threats to, or opportunities for, salmon conservation and management[2]; and	2.3–2.6
1.3	provide a compilation of tag releases by country in 2019.	2.7
1.4	identify relevant data deficiencies, monitoring needs and research requirements;	2.4 and Annex 7
~~1.5~~	~~provide an overview of the methods used by jurisdictions to calculate conservation limits, including assumptions, benefits and short comings of each method, and advise on next steps to improve methodologies and include how conservation limits are used for setting catch advice;~~	Not applicable
~~1.6~~	~~provide an update on the distribution and abundance of pink salmon across the North Atlantic and advise on potential threats to wild Atlantic salmon.~~	Not applicable
2	**With respect to Atlantic salmon in the Northeast Atlantic Commission area:**	Section 3
2.1	describe the key events of the 2019 fisheries[3];	3.1
2.2	review and report on the development of age-specific stock conservation limits, including updating the time-series of the number of river stocks with established CLs by jurisdiction; and	3.2
2.3	describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction.	3.3

Question		Section
3	**With respect to Atlantic salmon in the North American Commission area:**	Section 4
3.1	describe the key events of the 2019 fisheries (including the fishery at Saint Pierre and Miquelon)[3];	4.1
3.2	update age-specific stock conservation limits based on new information as available, including updating the time-series of the number of river stocks with established CLs by jurisdiction; and	4.2
3.3	describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction.	4.3
4	**With respect to Atlantic salmon in the West Greenland Commission area:**	Section 5
4.1	describe the key events of the 2019 fisheries[3]; and	5.1
4.2	describe the status of the stocks[4].	5.3

Notes:

[1] With regard to question 1.1, for the estimates of unreported catch the information provided should, where possible, indicate the location of the unreported catch in the following categories: in-river; estuarine; and coastal. Numbers of salmon caught and released in recreational fisheries should be provided.

[2] With regard to question 1.2, ICES is requested to include reports on any significant advances in understanding of the biology of Atlantic salmon that is pertinent to NASCO, including information on any new research into the migration and distribution of salmon at sea and the potential implications of climate change for salmon management.

[3] In the responses to questions 2.1, 3.1 and 4.1, ICES is asked to provide details of catch, gear, effort, composition and origin ofthe catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Information on any other sources of fishing mortality for salmon is also requested (For 4.1, if any new phone surveys are conducted, ICES should review the results and advise on the appropriateness for incorporating resulting estimates of unreported catch into the assessment process).

[4] In response to question 4.2, ICES is requested to provide a brief summary of the status of North American and Northeast Atlantic salmon stocks. The detailed information on the status of these stocks should be provided in response to questions 2.3 and 3.3.

In response to the Terms of Reference, the Working Group considered 25 Working Documents submitted by participants (Annex 1). Information provided by correspondence by Working Group members unable to participate in the web conference is included in the list of working documents. References cited in the Report are provided in Annex 2, a full address list for the meeting participants is provided in Annex 3 and a complete list of acronyms used within this document is provided in Annex 6.

1.2 Participants

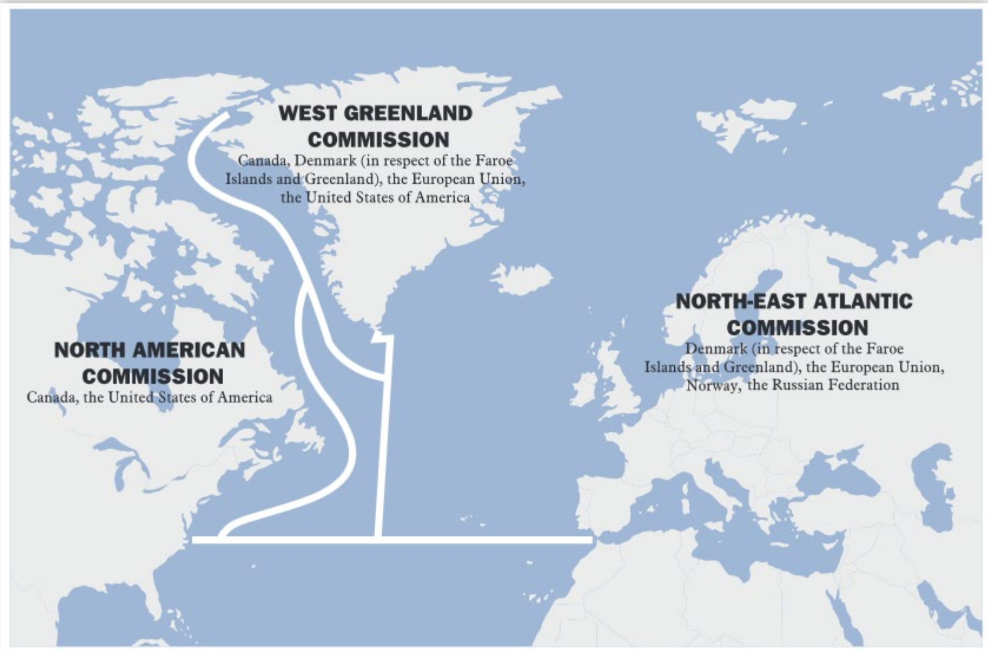
Member	Country
April, J.	Canada
Bardarson, H.	Iceland
Bolstad, G.	Norway
Bradbury, I.	Canada (by correspondence)
Buoro, M.	France

Member	Country
Camara, K.	Germany
Chaput, G.	Canada
Cooper, A.	Denmark (ICES)
Dauphin, G.	Canada
Ensing, D.	UK (Northern Ireland)
Erkinaro, J.	Finland
Fiske, P.	Norway
Freese, M.	Germany
Gillson, J.	UK (England & Wales)
Gregory, S.	UK (England & Wales)
Jepsen, N.	Denmark
Jones, D.	Sweden (by correspondence)
Kelly, N.	Canada
Kjems-Nielsen, N.	Denmark (ICES)
Maxwell, H.	Ireland
Meerburg, D.	Canada
Millane, M.	Ireland
Nygaard, R.	Greenland
Ounsley, J.	UK (Scotland)
Prusov, S.	Russian Federation
Raab, D.	Canada
Reader, J.	Canada
Rivot, E.	France
Robertson, M.	Canada
Sheehan, T.	United States
Utne, K.	Norway
Walker, A.	UK (England & Wales)
Wennevik, V.	Norway

1.3 Management framework for salmon in the North Atlantic

The advice generated by ICES in response to the Terms of Reference posed by the North Atlantic Salmon Conservation Organisation (NASCO), is pursuant to NASCO's role in international management of salmon. NASCO was set up in 1984 by international convention (the Convention for the Conservation of Salmon in the North Atlantic Ocean), with a responsibility for the conservation, restoration, enhancement, and rational management of wild salmon in the North Atlantic. While sovereign states retain their role in the regulation of salmon fisheries for salmon originating in their own rivers, distant water salmon fisheries, such as those at Greenland and Faroes, which take salmon originating in rivers of another Party are regulated by NASCO under the terms of the Convention. NASCO now has six Parties that are signatories to the Convention, including the EU which represents its Member States.

NASCO discharges these responsibilities *via* three Commission areas shown below:



1.4 Management objectives

NASCO has identified the primary management objective of that organisation as:

"To contribute through consultation and cooperation to the conservation, restoration, enhancement and rational management of salmon stocks taking into account the best scientific advice available".

NASCO further stated that "the Agreement on the Adoption of a Precautionary Approach states that an objective for the management of salmon fisheries is to provide the diversity and abundance of salmon stocks" and NASCO's Standing Committee on the Precautionary Approach interpreted this as being "to maintain both the productive capacity and diversity of salmon stocks" (NASCO, 1998).

NASCO's Action Plan for Application of the Precautionary Approach (NASCO, 1999) provides interpretation of how this is to be achieved, as follows:

- "Management measures should be aimed at maintaining all stocks above their conservation limits by the use of management targets".
- "Socio-economic factors could be taken into account in applying the Precautionary Approach to fisheries management issues".
- "The precautionary approach is an integrated approach that requires, inter alia, that stock rebuilding programmes (including, as appropriate, habitat improvements, stock enhancement, and fishery management actions) be developed for stocks that are below conservation limits".

1.5 Reference points and application of precaution

Conservation limits (CLs) for North Atlantic salmon stock complexes have been defined as the level of stock (number of spawners) that will achieve long-term average maximum sustainable yield (MSY). In many regions of North America, the CLs are calculated as the number of spawners required to fully seed the wetted area of the river. The definition of conservation in Canada varies by region and in some areas, historically, the values used were equivalent to maximizing/ optimizing freshwater production. These are used in Canada as limit reference points and they do not correspond to MSY values. Reference points for Atlantic salmon are currently being reviewed for conformity with the Precautionary Approach policy in Canada. Revised reference points are expected to be developed. In some regions of Europe, pseudo stock–recruitment observations are used to calculate a hockey-stick relationship, with the inflection point defining the CLs. In the remaining regions, the CLs are calculated as the number of spawners that will achieve long-term average MSY, as derived from the adult-to-adult stock and recruitment relationship (Ricker, 1975; ICES, 1993). NASCO has adopted the region specific CLs (NASCO, 1998). These CLs are limit reference points (S_{lim}); having populations fall below these limits should be avoided with high probability.

Atlantic salmon has characteristics of short-lived fish stocks; mature abundance is sensitive to annual recruitment because there are only a few age groups in the adult spawning stock. Incoming recruitment is often the main component of the fishable stock. For such fish stocks, the ICES MSY approach is aimed at achieving a target escapement (MSY $B_{escapement}$, the amount of biomass left to spawn). No catch should be allowed unless this escapement can be achieved. The escapement level should be set so there is a low risk of future recruitment being impaired, similar to the basis for estimating B_{pa} in the precautionary approach. In short-lived stocks, where most of the annual surplus production is from recruitment (not growth), MSY $B_{escapement}$ and B_{pa} might be expected to be similar.

It should be noted that this is equivalent to the ICES precautionary target reference points (S_{pa}). Therefore, stocks are regarded by ICES as being at full reproductive capacity only if they are above the precautionary target reference point. This approach parallels the use of precautionary reference points used for the provision of catch advice for other fish stocks in the ICES area.

Management targets have not yet been defined for all North Atlantic salmon stocks. When these have been defined, they will play an important role in ICES advice.

For the assessment of the status of stocks and advice on management of national components and geographical groupings of the stock complexes in the NEAC area, where there are no specific management objectives:

- ICES requires that the lower bound of the confidence interval of the current estimate of spawners is above the CL for the stock to be considered at full reproductive capacity.

- When the lower bound of the confidence limit is below the CL, but the midpoint is above, then ICES considers the stock to be at risk of suffering reduced reproductive capacity.
- Finally, when the midpoint is below the CL, ICES considers the stock to be suffering reduced reproductive capacity.

For catch advice on fish exploited at West Greenland (non-maturing 1SW fish from North America and non-maturing 1SW fish from Southern NEAC), ICES has adopted, a risk level of 75% of simultaneous attainment of management objectives (ICES, 2003) as part of an management plan agreed by NASCO. ICES applies the same level of risk aversion for catch advice for homewater fisheries on the North American stock complex.

NASCO has not formally agreed a management plan for the fishery at Faroes. However, the Working Group has developed a risk-based framework for providing catch advice for fish exploited in this fishery (mainly MSW fish from NEAC countries). Catch advice is currently provided at both the stock complex and country level (for NEAC stocks only) and catch options tables provide both individual probabilities and the probability of simultaneous attainment of meeting proposed management objectives for both. ICES has recommended (ICES, 2013) that management decisions should be based principally on a 95% probability of attainment of CLs in each stock complex/ country individually. The simultaneous attainment probability may also be used as a guide, but managers should be aware that this will generally be quite low when large numbers of management units are used.

2 Atlantic salmon in the North Atlantic area

2.1 Catches of North Atlantic salmon

2.1.1 Nominal catches of salmon

The nominal catch of a fishery is defined as the round, fresh weight of fish that are caught and retained. Total nominal catches of salmon reported by country in all fisheries for 1960–2019 are given in Table 2.1.1.1. Catch statistics in the North Atlantic also include fish-farm escapees and, in some Northeast Atlantic countries, ranched fish (see Section 2.2.2). Catch and release has become increasingly commonplace in some countries, but these fish do not appear in the nominal catches (see Section 2.1.2).

Icelandic catches have traditionally been split into two categories, wild and ranched, reflecting the fact that Iceland has been the main North Atlantic country where large-scale ranching has been undertaken with the specific intention of harvesting all returns at the release site and with no prospect of wild spawning success. The release of smolts for commercial ranching purposes ceased in Iceland in 1998, but ranching for rod fisheries in two Icelandic rivers continued into 2019 (Table 2.1.1.1). Catches in Sweden have also now been split between wild and ranched categories over the entire time-series. The latter fish represent adult salmon which have originated from hatchery-reared smolts, and which have been released under programmes to mitigate for hydropower development schemes. These fish are also exploited very heavily in homewaters and have no possibility of spawning naturally in the wild. While ranching does occur in some other countries, this is on a much smaller scale. Some of these operations are experimental and at others harvesting does not occur solely at the release site. The ranched component in these countries has therefore been included in the nominal catch.

Figure 2.1.1.1 shows the total reported nominal catch of salmon grouped by the following areas: 'Northern Europe' (Norway, Russia, Finland, Iceland, Sweden and Denmark); 'Southern Europe' (Ireland, UK (Scotland), UK (England & Wales), UK (Northern Ireland), France and Spain); 'North America' (Canada, USA and St Pierre et Miquelon (France)); and 'Greenland and Faroes'.

The provisional total nominal catch for 2019 was 868 t, 179 t below the updated catch for 2018 (1047 t) and 294 and 437 t below the previous five- and ten-year means, respectively. Catches in the majority of countries/jurisdictions were below the previous five- and ten-year means and were the lowest in the time-series (1960 to 2019) in Iceland (wild), Finland, Ireland, UK (England & Wales) and UK (Scotland) (Table 2.1.1.1).

Nominal catches (weight only) in homewater fisheries were split, where available, by sea age or size category (Table 2.1.1.2). The data for 2019 are provisional and, as in Table 2.1.1.1, include both wild and reared salmon and fish-farm escapees in some countries. A more detailed breakdown, providing both numbers and weight for different sea-age groups for most countries, is provided in Annex 4. Countries use different methods to partition their catches by sea-age class (outlined in the footnotes to Annex 4). The composition of catches in different areas is discussed in more detail in Sections 3, 4, and 5.

ICES recognises that mixed-stock fisheries present particular threats to stock status (ICES, 2019). These fisheries predominantly operate in coastal areas and NASCO specifically requests that the nominal catches in homewater fisheries be partitioned according to whether the catch is taken in coastal, estuarine or riverine areas. Figure 2.1.1.2 presents these data on a country-by-country basis. It should be noted, however, that the way in which the nominal catch is partitioned among categories varies between countries, particularly for estuarine and coastal fisheries. For example, in some countries these catches are split according to particular gear types whereas in other countries the split is based on whether fisheries operate inside or outside of headlands. While it is generally easier to allocate the freshwater (riverine) component of the catch, it should also be noted that catch and release (C&R) is now in widespread use in many countries (Section 2.1.2) and these fish are excluded from the nominal catch. Noting these caveats, these data are considered to provide the best available indication of catch in these different fishery areas. Figure 2.1.1.2 shows that there is considerable variability in the distribution of the catch among individual countries. There are no coastal fisheries in Iceland, Spain, Denmark, or Finland. Coastal fisheries ceased in Ireland in 2007 and no fishing has occurred in coastal waters of UK (Northern Ireland) since 2012, in UK (Scotland) since 2015, or in the England area of UK (England & Wales) since 2019. In most countries in recent years, the majority of the catch has been taken in rivers and estuaries. However, in Norway and Russia roughly half of the total catch has been taken in coastal waters in recent years.

Coastal, estuarine and in-river catch data for the period 2009 to 2019 aggregated by region are presented in Figure 2.1.1.3 and the whole time-series are presented in Table 2.1.1.3. In the Northern NEAC area, catches in coastal fisheries have declined from 306 t in 2009 to 219 t in 2019, and in-river catches have declined from 594 t in 2009 and 390 t in 2019. At the beginning of the time-series about half the catch was taken in coastal waters and half in rivers, whereas since 2008 the coastal catch represents around 30%–40% of the total. In the Southern NEAC area, catches in coastal and estuarine fisheries have declined over the period. While coastal and estuarine fisheries have historically made up the largest component of the catch, coastal fisheries dropped sharply in 2007 (from 306 t in 2006 to 71 t in 2007) and remained at lower levels to 2018: there were no coastal catches in 2019. Estuarine fisheries have also declined, from 48 t in 2007 to 25 t in 2019. The reduction in more recent years in coastal and estuarine fisheries reflects widespread measures to reduce exploitation in a number of countries. At the beginning of the time-series about half the catch was taken in coastal waters and one third in rivers. In 2019, about one third of the catch was from estuarine fisheries and two thirds from in-river fisheries.

In North America, the total catch has been fluctuating between 80 and 182 t over the period 2009 to 2019. Around two thirds of the total catch in this area has been taken by in-river fisheries, although it was about half in 2018 and 2019. The estuarine catch has fluctuated between about 25 and 44%. The catch in coastal fisheries has been about 10% of the catch each year and relatively small in any year with the biggest catch taken in 2013 and 2017 (13 t in both years).

In Greenland, the total coastal catch increased steadily from 25 t in 2007 to 57 t in 2015 but decreased to 30 t in 2019**.** A small number of salmon have been caught in the estuary near the Kapisillit river (in 2019, 19 salmon, total weight 81 kg). Genetic studies have shown this river stock is very isolated from other stocks in the north Atlantic (Krohn 2013 unpublished; Arnekleiv *et al.*, 2018) and Krohn (2013) showed that salmon caught in the estuary were exclusively from the River Kapisillit.

2.1.2 Catch and release

The practice of catch and release in rod fisheries has become increasingly common. This has occurred in part as a consequence of salmon management measures aimed at conserving stocks while maintaining opportunities for recreational fisheries, but also reflects increasing voluntary release of fish by anglers. In some areas of Canada and USA, the mandatory release of large (MSW) salmon has been in place since 1984. Since the beginning of the 1990s, it has also been widely used in many European countries.

The nominal catches presented in Section 2.1.1 do not include salmon that have been caught and released. Table 2.1.2.1 presents catch and release information from 1991 to 2019 for countries that have records. Catch and release may also be practised in other countries while not being formally recorded or where figures are only recently available. There are large differences in the percentage of the total rod catch that is released: in 2019 this ranged from 20% in Sweden and Norway, to 92% in UK (Scotland) reflecting varying management practices and angler attitudes among these countries. There are no restrictions on the total numbers of fish that may be caught and released in most countries. For all countries, the percentage of fish released has tended to increase over time. There is also evidence from some countries that larger MSW fish are released in greater proportions than smaller fish. Overall, over 162 000 salmon were reported to have been released from rod fisheries around the North Atlantic in 2019, 8% below the previous five-year mean (around 177 000).

Catch and release is also practised in some commercial net fisheries, for example in UK (England & Wales) and UK (Scotland), where gears that previously targeted and retained salmon and sea trout, and kept the fish alive until retrieval, are now only allowed to retain sea trout and must release any salmon alive. A time-series for UK (England & Wales) exists from 1999 to date, with the amount released ranging between 30 and 411 salmon.

Summary information on how catch and release levels are incorporated into national assessments was provided to ICES in 2010 (ICES, 2010).

2.1.3 Unreported catches

Unreported catches by year (1987 to 2019) and Commission Area are presented in Table 2.1.3.1 and are presented relative to the total nominal catch in Figure 2.1.3.1. A description of the methods used to derive the unreported catches was provided in ICES (2000) and updated for the NEAC Region in ICES (2002). Detailed reports from different countries were also submitted to NASCO in 2007 in support of a special session on this issue. There have been no estimates of unreported catch for Russia since 2008, for Canada in 2007 and 2008, and for France since 2016. The unreported catch for Canada for 2019 is incomplete. There are also no estimates of unreported catch for Spain and Saint Pierre and Miquelon (France), where total catches are typically small.

In general, the methods used by each country to derive estimates of unreported catch have remained relatively unchanged and thus comparisons over time may be appropriate (see Stock Annex). However, the estimation procedures vary markedly between countries. For example, some countries include only illegally caught fish in the unreported catch, while other countries include estimates of unreported catch by legal gear as well as illegal catches in their estimates. Over recent years, efforts have been made to reduce the level of unreported catch in a number of countries (e.g. through improved reporting procedures and the introduction of carcase tagging and logbook schemes).

The total unreported catch in NASCO areas in 2019 was estimated to be 258 t. The unreported catch in the NEAC area in 2019 was estimated at 237 t, and those for West Greenland and the NAC area at 10 t and 12 t, respectively. The 2019 unreported catch by country is provided in Table 2.1.3.2. It is not possible to fully partition the unreported catches into coastal, estuarine and in-river areas.

Summary information on how unreported catches are incorporated into national and international assessments was provided to ICES in 2010 (ICES, 2010).

2.2 Farming and sea ranching of Atlantic salmon

2.2.1 Production of farmed Atlantic salmon

The provisional estimate of farmed Atlantic salmon production in the North Atlantic area for 2019 is 1750 kt, which is an increase on the production for 2018 (1596 kt) and the previous five-year mean (1590 kt). The production of farmed Atlantic salmon in this area has been over one million tonnes since 2009 (Table 2.2.1.1 and Figure 2.2.1.1). Norway and UK (Scotland) continue to produce the majority of the farmed salmon in the North Atlantic (78% and 11% respectively). Spain reported production of farmed salmon to the Working Group for the first time in 2019, with a time-series from 2015 (2018 no data): production in 2019 was 12 t and the maximum was 25 t in 2017 (Table 2.2.1.1). Farmed salmon production in 2019 was above the previous five-year mean in all countries with the exception of Canada and Spain. Data for UK (N. Ireland) since 2001 and data for east coast USA since 2012 are not reported to ICES, as the data are not publicly available. This is also the case for some regions within countries in some years.

Worldwide production of farmed Atlantic salmon has been over one million tonnes since 2001 and has been over two million tonnes since 2012. It is difficult to source reliable production figures for all countries outside the North Atlantic area and it has been necessary to use 2017 data from the FAO Fisheries and Aquaculture Department database for some countries in deriving a worldwide estimate for 2019. No data were available for production from the west coast of the USA at time of writing. The total worldwide production in 2019 is provisionally estimated at around 2504 kt (Table 2.2.1.1 and Figure 2.2.1.1), which is higher than in 2018 (2358 kt) and the previous five-year mean (2332 kt). Production of farmed Atlantic salmon outside the North Atlantic is estimated to have accounted for one third of the worldwide total in 2019 and is still dominated by Chile (81%). Atlantic salmon are being produced in land-based and closed containment facilities around the world and the figures provided in Table 2.2.1.1 may not include all countries where such production is occurring.

The worldwide production of farmed Atlantic salmon in 2019 was almost 3000 times the reported nominal catch of Atlantic salmon in the North Atlantic.

2.2.2 Harvest of ranched Atlantic salmon

Ranching has been defined as the production of salmon through smolt releases with the intent of harvesting the total population that returns to freshwater (harvesting can include fish collected for brood stock) (ICES, 1994). The release of smolts for commercial ranching purposes ceased in Iceland in 1998, but ranching with the specific intention of harvesting by rod fisheries has been practised in two Icelandic rivers since 1990 and these data are now included in the ranched catch (Table 2.1.1.1). A similar approach has been adopted, over the available time-series, for one river in Sweden (River Lagan). These hatchery origin smolts are released under programmes to mitigate for hydropower development schemes with no possibility of spawning naturally in the wild. These have therefore also been designated as ranched fish and are included in Figure 2.2.2.1. In Ireland, ranching is currently only carried out in two salmon rivers under limited experimental conditions. In 2019, a catch of 886 fish was reported on the Gudenå River in Denmark where the majority of fish are believed to be of ranched origin.

The total harvest of ranched Atlantic salmon in countries bordering the North Atlantic in 2019 was 26 t (Iceland, Ireland and Sweden; Table 2.2.2.1; Figure 2.2.2.1) with the majority of catch taken in Iceland (15 t). The total harvest was 25% below the previous five-year mean (35 t). No estimate of ranched salmon production was made in UK (N. Ireland) where the proportion of ranched fish was not assessed between 2008 and 2019 due to a lack of coded-wire-tag (CWT; microtags) returns.

2.3 Diseases and parasites

2.3.1 Red skin disease

In 2019, in at least five European countries (Denmark, Ireland, Norway, UK(Scotland) and Sweden), some fresh-run Atlantic salmon returning to rivers were encountered with superficial signs of disease ranging from localised red spots or rashes on the underbelly with cases of further progression to external lesions, ulceration and haemorrhaging and later mortality associated with secondary fungal infections (Figure 2.3.1.1). This disease was principally observed in 1SW fish in the period from late May to mid-August but some MSW fish were also reported to be affected. No such reports were received from Greenland, Canada or the USA.

In response to this emerging issue, a workshop was hosted by the Norwegian Institute for Nature Research (NINA) in November 2019 in Norway, and attended by veterinary scientists, fish biologists and fishery managers from seven European countries (Denmark, Finland, Ireland, Norway, Russia, Sweden and UK). At the workshop, reports on disease occurrence, veterinary sampling protocols and autopsy results, and associated national management responses were presented. Despite the extensive investigations (histopathology, virology, bacteriology, molecular testing) undertaken on retrieved specimens by the various fish health authorities, no attributable cause from an infectious agent could be established. It was concluded that clinical signs associated with the disease were not characteristic of commonly identified diseases associated with salmonid species. Therefore, it was agreed that the disease should be named 'red skin disease' (RSD). Further discussions took place on establishing diagnostic criteria and surveillance and sampling protocols for RSD. It was agreed that a common international database of records would be set up to track future occurrences of RSD. Future scientific collaborations and fisheries management responses were also discussed at the workshop. A full report of the RSD workshop will be published in due course.

2.4 Data Call for NASCO requested information used by the Working Group

The terms of reference from NASCO defines the work of the ICES WGNAS (the Working Group). Other than for the catch data, the terms of reference are not specific as to what type of information would be used by ICES to develop the status of stocks.

2.4.1 Process for collating catch data

The request for catch data is specific as to the type of information to be compiled:

- provide an overview of salmon catches and landings by country, including unreported catches and catch and release, and production of farmed and ranched Atlantic salmon in 2019[1].

In each Commission Area, the request includes:

- describe the key events of the 2019 fisheries[2] (ToR 2.1, 3.1, 4.1)

with specifics provided in footnotes 1 and 2:

1. *With regard to question 1.1, for the estimates of unreported catch the information provided should, where possible, indicate the location of the unreported catch in the following categories: in-river; estuarine; and coastal. Numbers of salmon caught and released in recreational fisheries should be provided;*
2. *In the responses to questions 2.1, 3.1 and 4.1, ICES is asked to provide details of catch, gear, effort, composition and origin of the catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Information on any other sources of fishing mortality for salmon is also requested (For 4.1, if any new phone surveys are conducted, ICES should review the results and advise on the appropriateness for incorporating resulting estimates of unreported catch into the assessment process).*

2.4.2 Review of the 2020 Data Call

On 23 February 2020, ICES communicated the Data Call for Atlantic Salmon from the North Atlantic to ICES Member Countries. Subsequently on 4 March 2020, the chair and the data call contact of the WGNAS copied the ICES Data Call to members of the Working Group. The Data Call note included instructions and a template spreadsheet in Excel as attachments. The request was for members to return the catch data for 2019 to ICES by 23 March 2020.

The Data Call was specific to the compilation of catches as defined in the terms of reference from NASCO. Note also that NASCO requests from parties as part of the annual reporting similar information as requested by ICES in the Data Call.

The Data Call should provide data that can be used by the WGNAS to address the NASCO request, i.e. for the primary catch tables in the WGNAS report (Tables 2.1.1.1, 2.1.1.2, 2.1.2.1, 2.1.3.1, 2.2.1.1, 2.2.2.1; Figures 2.1.1.2, 2.1.1.3, 2.1.3.1, 2.2.1.1, 2.2.2.1). When collated across jurisdictions, the Data Call submissions should be appropriate for NASCO themselves to generate summaries, using pivot tables or other software. The Data Call request would also provide catch data that are used in the North Atlantic wide Life-cycle model used to assess stock status and develop catch advice.

In previous years, the data requested in the Data Call would have been compiled by members of the Working Group and summarized in the report. The ICES Data Call resulted in more prompt and more complete reporting for some countries where in the past the collation of catch data had been difficult and incomplete.

The following country/jurisdiction reports were received (as of 27 March 2020):

- NAC: Canada, US, France (Saint Pierre and Miquelon);
- NEAC: Iceland, Spain, France, UK (England and Wales), UK (Scotland), UK (Northern Ireland), Germany, Denmark, Sweden, Norway, Finland;
- WGC: Greenland.

Reports were not received for the following NEAC jurisdictions with known/historic salmon fisheries or farmed salmon production: Ireland, Russia, Faroe Islands, Portugal. Equivalent data from Ireland, Russia and Faroe Islands were received via national reports to the Working Group.

The data submitted in March 2020 were reviewed by the Working Group and some issues were identified. Details of the data call review and proposed changes are outlined in Annex 8.

2.5 Embedding Atlantic salmon stock assessment within an integrated Bayesian life-cycle modelling framework

The Working Group previously reviewed developments in modelling and forecasting the abundance of Atlantic salmon using the Bayesian life-cycle model (ICES, 2015b; 2016; 2017a; 2018; 2019). The life-cycle model improves on the stock assessment approach currently used by ICES to estimate abundance of post-smolts at sea before any fisheries (Pre Fishery Abundance; PFA), and to assess the consequences of catch options at sea on the returns to homewaters for different jurisdictions in Europe and North America (ICES, 2019). It also provides a framework to improve the understanding of the drivers and mechanisms of changes in Atlantic salmon population dynamics and productivity in the North Atlantic (Olmos *et al*., 2019; 2020).

2.5.1 Progress in stock assessment models

The previous version of the life-cycle model reviewed in 2017 was applied to six stock units in NAC and seven stock units in Southern NEAC, where the populations of all stock units follow the same life-history processes, but with stock-specific parameters and data inputs. Stock units of Northern NEAC were not included because the available time-series only cover the period after 1983.

In 2018, the Working Group reviewed an extension of the life-cycle model to eleven stock units in Northern NEAC. The model has been applied to time-series of data that extend from 1971 to 2014. The oldest part of the time-series (1971–1982) had previously been excluded because of high uncertainty in the data from Norwegian stock units. This was addressed by increasing uncertainty around return estimates to account for the higher uncertainty in the historical part of the time-series.

In 2019, the Working Group reviewed a model that incorporated the dynamics of all stock units in NAC, Southern NEAC and Northern NEAC in a single hierarchical model (Rivot *et al*., 2019). The model provides the opportunity for modelling covariation in the dynamics of the different populations that share migration routes and feeding areas at sea, and which are harvested in mixed-stock fisheries, particularly at West Greenland for NAC and NEAC and at Faroes for NEAC. The model provides estimates of trends in marine productivity (expressed as post-smolt survival rate to 1 January of the first winter at sea) and the proportion maturing as 1SW salmon for all stock units in Northern and Southern NEAC, and NAC. Additionally, a single model is now used to forecast the population dynamics of all stock units simultaneously, which is of particular interest when assessing catch options for mixed-stock fisheries operating on a mixture of stocks from NAC, Northern and Southern NEAC (West Greenland and Faroes). The model also provides a potential major extension to the assessment and forecast models of Atlantic salmon currently used by ICES, by optionally providing catch options for the joint West Greenland and Faroes salmon fisheries.

Based on the life cycle previously described, the environmental drivers and the demographic mechanisms of the widespread decline of marine survival rates of Atlantic salmon in the North Atlantic were investigated by considering the 13 stocks units from the NAC and Southern NEAC complexes (Olmos *et al*., 2020). Results support the hypothesis of a simultaneous response of salmon populations to large-scale bottom–up environmentally driven changes in the North Atlantic that can impact on populations originating in distant continental habitats. In addition, the ecological drivers and/or mechanisms differ between NAC and Southern NEAC populations because of their partially different migration routes at sea.

In 2020, no major update was provided. The computational speed of the model was slightly improved. A comparison of results provided by PFA models and the life-cycle model is in preparation (based on WGNAS 2018 data). Preliminary results highlight that the overall patterns and trends in PFA and productivity estimates are very similar between the two models. However, some slight differences exist in estimates of egg deposition, PFA, and marine productivity. Those differences are essentially due to differences in demographical structure between the models. The dynamic of 1SW fish is not accounted for in the NAC PFA model while both 1SW and 2SW are considered in the life-cycle model. Additionally, covariation in the temporal variations of marine productivity and the proportion of PFA maturing as 1SW are considered in the life-cycle model for all complexes, but PFA models have only incorporated covariation in productivity for the NAC stock units and not between NEAC stock units.

2.5.2 Recommendation for model workshop

In preparation for a future Benchmark, and the application by the Working Group for the assessment and multiyear catch advice, a workshop of jurisdictional experts and modellers to train the participants in the use of the life-cycle model and to formalise the workflow of the new modelling framework is recommended.

The life-cycle modelling workshop is proposed to be held in France (or in Denmark, location to be confirmed) in December 2020 or January 2021, in order for these discussions and advancements to occur. The objectives of the meeting are described in the draft terms of reference (see draft ToR in Annex 9).

2.6 Reports from ICES expert group and other investigations relevant to North Atlantic salmon

2.6.1 The Regional Database and Estimation System (RDBES)

The Regional Database and Estimation System (RDBES) will replace the current ICES Regional Database (RDB) and InterCatch systems (Currie *et al*., 2018, ICES 2020); its aims are:

1. To ensure that commercial fisheries data can be made available for the coordination of regional fisheries data sampling plans, including for the Data Collection Framework (DCF) Regional Coordination Groups (RCGs),
2. To provide a regional estimation system such that statistical estimates of quantities of interest can be produced from sample data,
3. To serve and facilitate the production of fisheries management advice and status reports,
4. To increase the awareness of fisheries data collected by the users of the RDBES and the overall usage of these data.

The RDBES will store aggregated landings and fishing effort data, and detailed biological sample data. The RDBES data model provides a common structure to describe both the disaggregated sampling data and, most importantly, how it was sampled.

For the purposes of stock assessment, it is necessary to combine detailed biological data with census data of fishing activity to produce an estimate of the removals from the fish stock due to fishing mortality. The RDBES data model allows a variety of different estimation techniques to be used; in particular, it will allow unbiased design-based estimation methods. The RDBES should be seen as part of the movements towards Statistically Sound Sampling Schemes (4S), greater regional coordination, and improved estimates to ICES stock assessments and advice.

The RDBES web application will provide certain functionality such as data uploading and managing permissions, but stock estimation will be performed within the ICES Transparent Assessment Framework (TAF).

As stated by ICES, RDBES does not currently support recreational catch data. However, data standards are essential and there may be schema structures currently within RDBES that could be applied to the Atlantic Salmon Data Call and database format. The Working Group and RDBES Steering Group will continue to liaise to facilitate future opportunities to align.

2.7 NASCO has asked ICES to provide a compilation of tag releases by country in 2019

Data on releases of tagged, fin-clipped and other marked salmon in 2019 were provided to the Working Group, and are compiled as a separate report (ICES WGNAS Addendum, 2020). In summary (Table 2.7.1), approximately 2.2 million salmon were marked in 2019, a decrease from the 2.7 million fish marked in 2018. The adipose clip was the most commonly used primary mark (1.73 million), with coded wire microtags (CWT) (0.282 million) the next most common primary mark, and 161 705 fish were marked with internal tags. Most marks were applied to hatchery-origin juveniles (2.08 million), while 93 165 wild juveniles, 6629 wild adults and 13 933 hatchery adults were also marked. The use of PIT tags, Data Storage Tags (DSTs), radio and/or sonic transmitting tags (pingers) has increased in recent years and in 2019, 161 705 salmon were tagged with these tag types (Table 2.7.1) which was an increase from previous year (135 157). The Working Group noted that not all electronic tags were reported in the tag compilation. Tag users should be encouraged to include these tags or tagging programmes as this greatly facilitates identification of the origin of tags recovered in fisheries or tag scanning programmes in other jurisdictions.

A recommendation has been developed by the Working Group for more efficient identification of the origin of PIT tagged salmon. A creation of a database listing individual PIT tag numbers or codes identifying the origin, source or programme of the tags should be recorded on a North Atlantic basin-wide scale. This is needed to facilitate identification of individual tagged fish taken in marine fisheries or surveys back to the source. Data on individual PIT tags used in Norway has now been compiled, but an ICES coordinated database, where the data could be stored, is needed.

Since 2003, the Working Group has reported information on marks being applied to farmed salmon to facilitate tracing the origin of farmed salmon captured in the wild in the case of escape events. In the USA, genetic “marking” procedures have been adopted where brood stock are genetically screened, and the resulting database is used to match genotyped escaped farmed salmon to a specific parental mating pair and subsequent hatchery of origin, stocking group, and marine site the individual escaped from. This has also been applied in Iceland, and in the 2018 and 2019 fisheries, 15 out of 18 farmed escapees could be traced to the pens they escaped from by matching their genotypes to known parental genotypes, and a further two could be traced to foreign brood stocks.

Issues pertinent to particular Commission areas are included in subsequent sections and, where appropriate, carried forward to the recommendations (Annex 7).

Table 2.1.1.1. Total reported nominal catch of salmon by country (in tonnes round fresh weight), 1960–2019 (2019 figures include provisional data).

Year	NAC Area			NEAC (N. Area)								NEAC (S. Area)						Faroes and Greenland					Unreported catches	
						Iceland		Sweden																
	Canada (1)	USA	St P&M	Norway (2)	Russia (3)	Wild	Ranch (4)	Wild	Ranch (15)	Denmark	Finland	Ireland (5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
1960	1636	1	-	1659	1100	100	-	40	0	-	-	743	283	139	1443	-	33	-	-	60	-	7237	-	-
1961	1583	1	-	1533	790	127	-	27	0	-	-	707	232	132	1185	-	20	-	-	127	-	6464	-	-
1962	1719	1	-	1935	710	125	-	45	0	-	-	1459	318	356	1738	-	23	-	-	244	-	8673	-	-
1963	1861	1	-	1786	480	145	-	23	0	-	-	1458	325	306	1725	-	28	-	-	466	-	8604	-	-
1964	2069	1	-	2147	590	135	-	36	0	-	-	1617	307	377	1907	-	34	-	-	1539	-	10759	-	-
1965	2116	1	-	2000	590	133	-	40	0	-	-	1457	320	281	1593	-	42	-	-	861	-	9434	-	-
1966	2369	1	-	1791	570	104	2	36	0	-	-	1238	387	287	1595	-	42	-	-	1370	-	9792	-	-
1967	2863	1	-	1980	883	144	2	25	0	-	-	1463	420	449	2117	-	43	-	-	1601	-	11991	-	-
1968	2111	1	-	1514	827	161	1	20	0	-	-	1413	282	312	1578	-	38	5	-	1127	403	9793	-	-
1969	2202	1	-	1383	360	131	2	22	0	-	-	1730	377	267	1955	-	54	7	-	2210	893	11594	-	-
1970	2323	1	-	1171	448	182	13	20	0	-	-	1787	527	297	1392	-	45	12	-	2146	922	11286	-	-
1971	1992	1	-	1207	417	196	8	17	1	-	-	1639	426	234	1421	-	16	-	-	2689	471	10735	-	-

Year	NAC Area			NEAC (N. Area)								NEAC (S. Area)						Faroes and Greenland					Unreported catches	
						Iceland		Sweden																
	Canada (1)	USA	St P&M	Norway (2)	Russia (3)	Wild	Ranch (4)	Wild	Ranch (15)	Denmark	Finland	Ireland (5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
1972	1759	1	-	1578	462	245	5	17	1	-	32	1804	442	210	1727	34	40	9	-	2113	486	10965	-	-
1973	2434	3	-	1726	772	148	8	22	1	-	50	1930	450	182	2006	12	24	28	-	2341	533	12670	-	-
1974	2539	1	-	1633	709	215	10	31	1	-	76	2128	383	184	1628	13	16	20	-	1917	373	11877	-	-
1975	2485	2	-	1537	811	145	21	26	0	-	76	2216	447	164	1621	25	27	28	-	2030	475	12136	-	-
1976	2506	1	3	1530	542	216	9	20	0	-	66	1561	208	113	1019	9	21	40	<1	1175	289	9327	-	-
1977	2545	2	-	1488	497	123	7	9	1	-	59	1372	345	110	1160	19	19	40	6	1420	192	9414	-	-
1978	1545	4	-	1050	476	285	6	10	0	-	37	1230	349	148	1323	20	32	37	8	984	138	7682	-	-
1979	1287	3	-	1831	455	219	6	11	1	-	26	1097	261	99	1076	10	29	119	<0.5	1395	193	8118	-	-
1980	2680	6	-	1830	664	241	8	16	1	-	34	947	360	122	1134	30	47	536	<0,5	1194	277	10127	-	-
1981	2437	6	-	1656	463	147	16	25	1	-	44	685	493	101	1233	20	25	1025	<0.5	1264	313	9954	-	-
1982	1798	6	-	1348	364	130	17	24	1	-	54	993	286	132	1092	20	10	606	<0.5	1077	437	8395	-	-
1983	1424	1	3	1550	507	166	32	27	1	-	58	1656	429	187	1221	16	23	678	<0.5	310	466	8755	-	-
1984	1112	2	3	1623	593	139	20	39	1	-	46	829	345	78	1013	25	18	628	<0.5	297	101	6912	-	-
1985	1133	2	3	1561	659	162	55	44	1	-	49	1595	361	98	913	22	13	566	7	864	-	8108	-	-

Year	NAC Area			NEAC (N. Area)								NEAC (S. Area)						Faroes and Greenland				Total Reported Nominal Catch	Unreported catches	
						Iceland		Sweden																
	Canada (1)	USA	St P&M	Norway (2)	Russia (3)	Wild	Ranch (4)	Wild	Ranch (15)	Denmark	Finland	Ireland (5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)		NASCO areas (13)	International waters (14)
1986	1559	2	3	1598	608	232	59	52	2	-	37	1730	430	109	1271	28	27	530	19	960	-	9255	315	-
1987	1784	1	2	1385	564	181	40	43	4	-	49	1239	302	56	922	27	18	576	<0.5	966	-	8159	2788	-
1988	1310	1	2	1076	420	217	180	36	4	-	36	1874	395	114	882	32	18	243	4	893	-	7737	3248	-
1989	1139	2	2	905	364	141	136	25	4	-	52	1079	296	142	895	14	7	364	-	337	-	5904	2277	-
1990	911	2	2	930	313	141	285	27	6	13	60	567	338	94	624	15	7	315	-	274	-	4925	1890	180-350
1991	711	1	1	876	215	129	346	34	4	3	70	404	200	55	462	13	11	95	4	472	-	4106	1682	25-100
1992	522	1	2	867	167	174	462	46	3	10	77	630	171	91	600	20	11	23	5	237	-	4119	1962	25-100
1993	373	1	3	923	139	157	499	44	12	9	70	541	248	83	547	16	8	23	-	-	-	3696	1644	25-100
1994	355	0	3	996	141	136	313	37	7	6	49	804	324	91	649	18	10	6	-	-	-	3945	1276	25-100
1995	260	0	1	839	128	146	303	28	9	3	48	790	295	83	588	10	9	5	2	83	-	3629	1060	-
1996	292	0	2	787	131	118	243	26	7	2	44	685	183	77	427	13	7	-	0	92	-	3136	1123	-
1997	229	0	2	630	111	97	59	15	4	1	45	570	142	93	296	8	4	-	1	58	-	2364	827	-
1998	157	0	2	740	131	119	46	10	5	1	48	624	123	78	283	8	4	6	0	11	-	2395	1210	-
1999	152	0	2	811	103	111	35	11	5	1	62	515	150	53	199	11	6	0	0	19	-	2247	1032	-

Year	NAC Area			NEAC (N. Area)								NEAC (S. Area)						Faroes and Greenland					Unreported catches	
						Iceland		Sweden																
	Canada (1)	USA	St P&M	Norway (2)	Russia (3)	Wild	Ranch (4)	Wild	Ranch (15)	Denmark	Finland	Ireland (5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
2000	153	0	2	1176	124	73	11	24	9	5	95	621	219	78	274	11	7	8	0	21	-	2912	1269	-
2001	148	0	2	1267	114	74	14	25	7	6	126	730	184	53	251	11	13	0	0	43	-	3069	1180	-
2002	148	0	2	1019	118	90	7	20	8	5	93	682	161	81	191	11	9	0	0	9	-	2654	1039	-
2003	141	0	3	1071	107	99	11	15	10	4	78	551	89	56	192	13	9	0	0	9	-	2457	847	-
2004	161	0	3	784	82	112	18	13	7	4	39	489	111	48	245	19	7	0	0	15	-	2157	686	-
2005	139	0	3	888	82	129	21	9	6	8	47	422	97	52	215	11	13	0	0	15	-	2155	700	-
2006	137	0	3	932	91	93	17	8	6	2	67	326	80	29	192	13	11	0	0	22	-	2028	670	-
2007	112	0	2	767	63	93	36	6	10	3	58	85	67	30	171	11	9	0	0	25	-	1548	475	-
2008	158	0	4	807	73	132	69	8	10	9	71	89	64	21	161	12	9	0	0	26	-	1721	443	-
2009	126	0	3	595	71	126	44	7	10	8	36	68	54	16	121	4	2	0	1	26	-	1318	343	-
2010	153	0	3	642	88	147	42	9	13	13	49	99	109	12	180	10	2	0	2	38	-	1610	393	-
2011	179	0	4	696	89	98	30	20	19	13	44	87	136	10	159	11	7	0	0	27	-	1629	421	-
2012	126	0	3	696	82	50	20	21	9	12	64	88	58	9	124	10	7	0	1	33	-	1412	403	-
2013	137	0	5	475	78	116	31	10	4	11	46	87	84	4	119	11	5	0	0	47	-	1269	306	-

Year	NAC Area			NEAC (N. Area)								NEAC (S. Area)						Faroes and Greenland					Unreported catches	
						Iceland		Sweden																
	Canada (1)	USA	St P&M	Norway (2)	Russia (3)	Wild	Ranch (4)	Wild	Ranch (15)	Denmark	Finland	Ireland (5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
2014	118	0	4	490	81	51	18	24	6	9	58	57	54	5	84	12	6	0	0	58	-	1134	287	-
2015	140	0	4	583	80	94	31	9	7	9	45	63	68	3	68	16	5	0	1	56	-	1282	325	-
2016	135	0	5	612	56	71	34	6	3	9	51	58	86	4	27	6	5	0	2	26	-	1195	335	-
2017	110	0	3	666	47	62	24	6	10	12	32	59	49	5	27	10	2	0	0	28	-	1152	353	-
2018	79	0	1	594	80	59	22	9	4	11	24	46	42	4	19	10	3	0	1	39	-	1047	311	-
2019	94	0	1	513	57	31	15	9	8	13	21	39	5	3	13	13	5	0	1	28	-	868	258	-
Mean																								
2014–2018	116	0	3	589	69	67	26	11	6	10	42	57	60	4	45	11	4	0	1	41	-	1162	322	-
2009–2018	130	0	3	605	75	87	30	12	8	11	45	71	74	7	93	10	4	0	1	38	-	1305	348	-

Key:

1. Includes estimates of some local sales, and, prior to 1984, bycatch.

2. Before 1966, sea trout and sea charr included (5% of total).

3. Figures from 1991 to 2000 do not include catches taken in the recreational (rod) fishery.

4. From 1990, catch includes fish ranched for both commercial and angling purposes.

5. Improved reporting of rod catches in 1994 and data derived from carcase tagging and logbooks from 2002.

6. Catch on River Foyle allocated 50% Ireland and 50% N. Ireland.

7. Angling catch (derived from carcase tagging and logbooks) first included in 2002.

8. Data for France include some unreported catches.

9. Spanish data until 2018 (inclusive), weights estimated from mean weight of fish caught in Asturias (80–90% of Spanish catch). Weight for 2019 for all Spain, supplied via data call.

10. Between 1991 & 1999, there was only a research fishery at Faroes. In 1997 & 1999, no fishery took place; the commercial fishery resumed in 2000, but has not operated since 2001.

11. Includes catches made in the West Greenland area by Norway, Faroes, Sweden and Denmark in 1965–1975.

12. Includes catches in Norwegian Sea by vessels from Denmark, Sweden, Germany, Norway and Finland.

13. No unreported catch estimate available for Canada in 2007 and 2008. Data for Canada in 2009, 2010, and 2019 are incomplete. No unreported catch estimate available for Russia since 2008.

14. Estimates refer to season ending in given year.

15. Catches from hatchery-reared smolts released under programmes to mitigate for hydropower development schemes; returning fish unable to spawn in the wild and exploited heavily.

Table 2.1.1.2. Total reported nominal catch of salmon in homewaters by country (in tonnes round fresh weight), 1960–2019 (2019 figures include provisional data). S = Salmon (2SW or MSW fish); G = Grilse (1SW fish); Sm = small; Lg = large; T = total = S + G or Lg + Sm.

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway (2)				Iceland		Sweden			Finland			Ireland (4,5)					UK (Scotland)					
				USA				Russia (3)	Wild	Ranch	Wild	Ranch	Denmark							UK (E&W)	UK (N.I.) (4,6)				France	Spain	
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
1960	-	-	1636	1	-	-	1659	1100	100	-	40	0	-	-	-	-	-	-	743	283	139	971	472	1443	-	33	7177
1961	-	-	1583	1	-	-	1533	790	127	-	27	0	-	-	-	-	-	-	707	232	132	811	374	1185	-	20	6337
1962	-	-	1719	1	-	-	1935	710	125	-	45	0	-	-	-	-	-	-	1459	318	356	1014	724	1738	-	23	8429
1963	-	-	1861	1	-	-	1786	480	145	-	23	0	-	-	-	-	-	-	1458	325	306	1308	417	1725	-	28	8138
1964	-	-	2069	1	-	-	2147	590	135	-	36	0	-	-	-	-	-	-	1617	307	377	1210	697	1907	-	34	9220
1965	-	-	2116	1	-	-	2000	590	133	-	40	0	-	-	-	-	-	-	1457	320	281	1043	550	1593	-	42	8573
1966	-	-	2369	1	-	-	1791	570	104	2	36	0	-	-	-	-	-	-	1238	387	287	1049	546	1595	-	42	8422
1967	-	-	2863	1	-	-	1980	883	144	2	25	0	-	-	-	-	-	-	1463	420	449	1233	884	2117	-	43	10390
1968	-	-	2111	1	-	-	1514	827	161	1	20	0	-	-	-	-	-	-	1413	282	312	1021	557	1578	-	38	8258
1969	-	-	2202	1	801	582	1383	360	131	2	22	0	-	-	-	-	-	-	1730	377	267	997	958	1955	-	54	8484
1970	1562	761	2323	1	815	356	1171	448	182	13	20	0	-	-	-	-	-	-	1787	527	297	775	617	1392	-	45	8206

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)			USA	Norway (2)			Russia (3)	Iceland		Sweden		Denmark	Finland			Ireland (4,5)			UK (E&W)	UK (N.I.) (4,6)	UK (Scotland)			France	Spain	
									Wild	Ranch	Wild	Ranch															
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
1971	1482	510	1992	1	771	436	1207	417	196	8	17	1	-	-	-	-	-	-	1639	426	234	719	702	1421	-	16	7574
1972	1201	558	1759	1	1064	514	1578	462	245	5	17	1	-	-	-	32	200	1604	1804	442	210	1013	714	1727	34	40	8356
1973	1651	783	2434	3	1220	506	1726	772	148	8	22	1	-	-	-	50	244	1686	1930	450	182	1158	848	2006	12	24	9767
1974	1589	950	2539	1	1149	484	1633	709	215	10	31	1	-	-	-	76	170	1958	2128	383	184	912	716	1628	13	16	9566
1975	1573	912	2485	2	1038	499	1537	811	145	21	26	0	-	-	-	76	274	1942	2216	447	164	1007	614	1621	25	27	9603
1976	1721	785	2506	1	1063	467	1530	542	216	9	20	0	-	-	-	66	109	1452	1561	208	113	522	497	1019	9	21	7821
1977	1883	662	2545	2	1018	470	1488	497	123	7	9	1	-	-	-	59	145	1227	1372	345	110	639	521	1160	19	19	7755
1978	1225	320	1545	4	668	382	1050	476	285	6	10	0	-	-	-	37	147	1082	1229	349	148	781	542	1323	20	32	6514
1979	705	582	1287	3	1150	681	1831	455	219	6	11	1	-	-	-	26	105	922	1027	261	99	598	478	1076	10	29	6340
1980	1763	917	2680	6	1352	478	1830	664	241	8	16	1	-	-	-	34	202	745	947	360	122	851	283	1134	30	47	8119
1981	1619	818	2437	6	1189	467	1656	463	147	16	25	1	-	-	-	44	164	521	685	493	101	844	389	1233	20	25	7351
1982	1082	716	1798	6	985	363	1348	364	130	17	24	1	-	49	5	54	63	930	993	286	132	596	496	1092	20	10	6275

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway (2)				Iceland		Sweden			Finland			Ireland (4,5)					UK (Scotland)					
				USA				Russia (3)	Wild	Ranch	Wild	Ranch	Denmark							UK (E&W)	UK (N.I.) (4,6)				France	Spain	
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
1983	911	513	1424	1	957	593	1550	507	166	32	27	1	-	51	7	58	150	1506	1656	429	187	672	549	1221	16	23	7298
1984	645	467	1112	2	995	628	1623	593	139	20	39	1	-	37	9	46	101	728	829	345	78	504	509	1013	25	18	5882
1985	540	593	1133	2	923	638	1561	659	162	55	44	1	-	38	11	49	100	1495	1595	361	98	514	399	913	22	13	6667
1986	779	780	1559	2	1042	556	1598	608	232	59	52	2	-	25	12	37	136	1594	1730	430	109	745	526	1271	28	27	7742
1987	951	833	1784	1	894	491	1385	564	181	40	43	4	-	34	15	49	127	1112	1239	302	56	503	419	922	27	18	6611
1988	633	677	1310	1	656	420	1076	420	217	180	36	4	-	27	9	36	141	1733	1874	395	114	501	381	882	32	18	6591
1989	590	549	1139	2	469	436	905	364	141	136	25	4	-	33	19	52	132	947	1079	296	142	464	431	895	14	7	5197
1990	486	425	911	2	545	385	930	313	146	280	27	6	13	41	19	60	-	-	567	338	94	423	201	624	15	7	4327
1991	370	341	711	1	535	342	876	215	129	346	34	4	3	53	17	70	-	-	404	200	55	285	177	462	13	11	3530
1992	323	199	522	1	566	301	867	167	174	462	46	3	10	49	28	77	-	-	630	171	91	361	238	599	20	11	3847
1993	214	159	373	1	611	312	923	139	157	499	44	12	9	53	17	70	-	-	541	248	83	320	227	547	16	8	3659
1994	216	139	355	0	581	415	996	141	136	313	37	7	6	38	11	49	-	-	804	324	91	400	248	648	18	10	3927

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)			USA	Norway (2)			Russia (3)	Iceland		Sweden		Denmark	Finland			Ireland (4,5)			UK (E&W)	UK (N.I.) (4,6)	UK (Scotland)			France	Spain	
									Wild	Ranch	Wild	Ranch															
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
1995	153	107	260	0	590	249	839	128	146	303	28	9	3	37	11	48	-	-	790	295	83	364	224	588	10	9	3530
1996	154	138	292	0	571	215	787	131	118	243	26	7	2	24	20	44	-	-	685	183	77	267	160	427	13	7	3035
1997	126	103	229	0	389	241	630	111	97	59	15	4	1	30	15	45	-	-	570	142	93	182	114	296	8	3	2300
1998	70	87	157	0	445	296	740	131	119	46	10	5	1	29	19	48	-	-	624	123	78	162	121	283	8	4	2371
1999	64	88	152	0	493	318	811	103	111	35	11	5	1	29	33	63	-	-	515	150	53	142	57	199	11	6	2220
2000	58	95	153	0	673	504	1176	124	73	11	24	9	5	56	39	96	-	-	621	219	78	161	114	275	11	7	2873
2001	61	86	148	0	850	417	1267	114	74	14	25	7	6	105	21	126	-	-	730	184	53	150	101	251	11	13	3016
2002	49	99	148	0	770	249	1019	118	90	7	20	8	5	81	12	94	-	-	682	161	81	118	73	191	11	9	2636
2003	60	81	141	0	708	363	1071	107	99	11	15	10	4	63	15	75	-	-	551	89	56	122	71	193	13	7	2432
2004	68	94	161	0	577	207	784	82	112	18	13	7	4	32	7	39	-	-	489	111	48	159	88	247	19	7	2133
2005	56	83	139	0	581	307	888	82	129	21	9	6	8	31	16	47	-	-	422	97	52	126	91	217	11	13	2133
2006	55	82	137	0	671	261	932	91	93	17	8	6	2	38	29	67	-	-	326	80	28	118	75	193	13	11	1999

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway (2)				Iceland		Sweden			Finland			Ireland (4,5)					UK (Scotland)					
				USA				Russia (3)	Wild	Ranch	Wild	Ranch	Denmark							UK (E&W)	UK (N.I.) (4,6)				France	Spain	
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
2007	49	63	112	0	627	140	767	63	93	36	6	10	3	52	6	59	-	-	85	67	30	100	71	171	11	9	1511
2008	57	100	157	0	637	170	807	73	132	69	8	10	9	65	6	71	-	-	89	64	21	110	51	161	12	9	1680
2009	52	74	126	0	460	135	595	71	126	44	7	10	8	25	13	38	-	-	68	54	16	83	37	121	5	2	1282
2010	53	100	153	0	458	184	642	88	147	42	9	13	13	37	13	49	-	-	99	109	12	111	69	180	10	2	1554
2011	69	110	179	0	556	140	696	89	98	30	20	19	13	29	15	44	-	-	87	136	10	126	33	159	11	7	1579
2012	52	74	126	0	534	162	696	82	50	20	21	9	12	31	33	64	-	-	88	58	9	84	40	124	10	8	1368
2013	66	72	138	0	358	117	475	78	116	31	10	4	11	32	14	46	-	-	87	84	4	74	45	119	11	4	1217
2014	41	77	118	0	319	171	490	81	51	18	24	6	9	31	26	58	-	-	56	54	5	58	26	84	12	6	1071
2015	54	86	140	0	430	153	583	80	94	31	9	7	9	32	13	45	-	-	63	68	3	39	29	68	16	5	1222
2016	56	79	135	0	495	117	612	56	71	34	6	3	9	37	14	51	-	-	58	86	5	18	8	27	6	5	1164
2017	55	55	110	0	503	164	666	47	62	24	6	10	12	27	5	32	-	-	59	49	5	19	7	27	10	2	1120
2018	39	39	79	0	427	167	594	80	59	22	9	4	11	13	11	24	-	-	46	42	4	12	8	19	10	3	1006

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway (2)				Iceland		Sweden			Finland			Ireland (4,5)					UK (Scotland)					
				USA				Russia (3)	Wild	Ranch	Wild	Ranch	Denmark							UK (E&W)	UK (N.I.) (4,6)				France	Spain	
	Lg	Sm	T	T	S	G	T	T	T	T	T	T	T	S	G	T	S	G	T	T	T	S	G	T	T	T	T
2019	46	48	94	0	391	122	513	57	31	15	9	8	13	17	4	21	-	-	39	5	3	8	5	13	13	5	838
Mean																											
2014–2018	49	67	116	0	435	154	589	69	67	26	11	6	10	28	14	42	-	-	57	60	4	29	16	45	11	4	1117
2009–2018	54	77	130	0	454	151	605	75	87	30	12	8	11	29	16	45	-	-	71	74	7	62	30	93	10	4	1258

Key:

1. Includes estimates of some local sales, and, prior to 1984, bycatch.

2. Before 1966, sea trout and sea charr included (5% of total).

3. Figures from 1991 to 2000 do not include catches of the recreational (rod) fishery.

4. Catch on River Foyle allocated 50% Ireland and 50% UK(N. Ireland).

5. Improved reporting of rod catches in 1994 and data derived from carcase tagging and log books from 2002.

6. Angling catch (derived from carcase tagging and logbooks) first included in 2002.

Table 2.1.1.3. Available time-series of nominal catch (tonnes round fresh weight) and percentages of total catches taken in coastal, estuarine and in-river fisheries by country, for the available time-series, 1996 to 2019. The way in which the nominal catch is partitioned among categories varies between countries, particularly for estuarine and coastal fisheries, see text for details.

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Canada	2000	2	2	29	19	117	79	148
Canada	2001	3	2	28	20	112	78	143
Canada	2002	4	2	30	20	114	77	148
Canada	2003	5	3	36	27	96	70	137
Canada	2004	7	4	46	29	109	67	161
Canada	2005	7	5	44	32	88	63	139
Canada	2006	8	6	46	34	83	60	137
Canada	2007	6	5	36	32	70	63	112
Canada	2008	9	6	47	32	92	62	147
Canada	2009	7	6	40	33	73	61	119
Canada	2010	6	4	40	27	100	69	146
Canada	2011	7	4	56	31	115	65	178
Canada	2012	8	6	46	36	73	57	127
Canada	2013	8	6	49	36	80	58	137
Canada	2014	7	6	28	24	83	71	118
Canada	2015	8	6	35	25	97	69	140
Canada	2016	8	6	34	25	93	69	135
Canada	2017	7	6	35	32	68	62	110
Canada	2018	7	9	35	45	36	46	79
Canada	2019	7	7	38	40	49	52	94
Finland	1996	0	0	0	0	44	100	44
Finland	1997	0	0	0	0	45	100	45
Finland	1998	0	0	0	0	48	100	48
Finland	1999	0	0	0	0	63	100	63
Finland	2000	0	0	0	0	96	100	96
Finland	2001	0	0	0	0	126	100	126
Finland	2002	0	0	0	0	94	100	94
Finland	2003	0	0	0	0	75	100	75
Finland	2004	0	0	0	0	39	100	39
Finland	2005	0	0	0	0	47	100	47
Finland	2006	0	0	0	0	67	100	67
Finland	2007	0	0	0	0	59	100	59
Finland	2008	0	0	0	0	71	100	71
Finland	2009	0	0	0	0	38	100	38

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Finland	2010	0	0	0	0	49	100	49
Finland	2011	0	0	0	0	44	100	44
Finland	2012	0	0	0	0	64	100	64
Finland	2013	0	0	0	0	46	100	46
Finland	2014	0	0	0	0	58	100	58
Finland	2015	0	0	0	0	45	100	45
Finland	2016	0	0	0	0	51	100	51
Finland	2017	0	0	0	0	32	100	32
Finland	2018	0	0	0	0	24	100	24
Finland	2019	0	0	0	0	21	100	21
France	1996	0	0	4	31	9	69	13
France	1997	0	0	3	38	5	63	8
France	1998	1	13	2	25	5	63	8
France	1999	0	0	4	35	7	65	11
France	2000	0	4	4	35	7	61	11
France	2001	0	4	5	44	6	53	11
France	2002	2	14	4	30	6	56	12
France	2003	0	0	6	44	7	56	13
France	2004	0	0	10	51	9	49	19
France	2005	0	0	4	38	7	62	11
France	2006	0	0	5	41	8	59	13
France	2007	0	0	4	42	6	58	11
France	2008	1	5	5	39	7	57	12
France	2009	0	4	2	34	3	62	5
France	2010	2	22	3	26	5	52	10
France	2011	0	3	6	54	5	43	11
France	2012	0	1	4	44	5	55	10
France	2013	0	3	4	40	6	57	11
France	2014	0	2	5	43	7	55	12
France	2015	4	23	5	32	7	45	16
France	2016	0	2	3	45	3	52	6
France	2017	1	5	3	36	6	59	10
France	2018	0	0	5	47	6	53	11
France	2019	0	0	7	51	7	49	13
Iceland	1996	11	9	0	0	111	91	122
Iceland	1997	0	0	0	0	156	100	156
Iceland	1998	0	0	0	0	164	100	164

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Iceland	1999	0	0	0	0	147	100	147
Iceland	2000	0	0	0	0	85	100	85
Iceland	2001	0	0	0	0	88	100	88
Iceland	2002	0	0	0	0	97	100	97
Iceland	2003	0	0	0	0	110	100	110
Iceland	2004	0	0	0	0	130	100	130
Iceland	2005	0	0	0	0	149	100	149
Iceland	2006	0	0	0	0	111	100	111
Iceland	2007	0	0	0	0	129	100	129
Iceland	2008	0	0	0	0	200	100	200
Iceland	2009	0	0	0	0	171	100	171
Iceland	2010	0	0	0	0	190	100	190
Iceland	2011	0	0	0	0	128	100	128
Iceland	2012	0	0	0	0	70	100	70
Iceland	2013	0	0	0	0	147	100	147
Iceland	2014	0	0	0	0	68	100	68
Iceland	2015	0	0	0	0	125	100	125
Iceland	2016	0	0	0	0	105	100	105
Iceland	2017	0	0	0	0	86	100	86
Iceland	2018	0	0	0	0	80	100	80
Iceland	2019	0	0	0	0	46	100	46
Ireland	1996	440	64	134	20	110	16	684
Ireland	1997	380	67	100	18	91	16	571
Ireland	1998	433	69	92	15	99	16	624
Ireland	1999	335	65	83	16	97	19	515
Ireland	2000	440	71	79	13	102	16	621
Ireland	2001	551	75	109	15	70	10	730
Ireland	2002	514	75	89	13	79	12	682
Ireland	2003	403	73	92	17	56	10	551
Ireland	2004	342	70	76	16	71	15	489
Ireland	2005	291	69	70	17	60	14	421
Ireland	2006	206	63	60	18	61	19	327
Ireland	2007	0	0	31	37	52	63	83
Ireland	2008	0	0	29	33	60	67	89
Ireland	2009	0	0	21	31	47	69	68
Ireland	2010	0	0	38	39	60	61	99
Ireland	2011	0	0	32	37	55	63	87

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Ireland	2012	0	0	28	32	60	68	88
Ireland	2013	0	0	38	44	49	56	87
Ireland	2014	0	0	26	46	31	54	57
Ireland	2015	0	0	21	33	42	67	63
Ireland	2016	0	0	19	33	39	67	58
Ireland	2017	0	0	18	31	41	69	59
Ireland	2018	0	0	15	33	31	67	46
Ireland	2019	0	0	15	39	23	61	39
Norway	1996	520	66	0	0	267	34	787
Norway	1997	394	63	0	0	235	37	629
Norway	1998	410	55	0	0	331	45	741
Norway	1999	483	60	0	0	327	40	810
Norway	2000	619	53	0	0	557	47	1176
Norway	2001	696	55	0	0	570	45	1266
Norway	2002	596	58	0	0	423	42	1019
Norway	2003	597	56	0	0	474	44	1071
Norway	2004	469	60	0	0	316	40	785
Norway	2005	463	52	0	0	424	48	888
Norway	2006	512	55	0	0	420	45	932
Norway	2007	427	56	0	0	340	44	767
Norway	2008	382	47	0	0	425	53	807
Norway	2009	284	48	0	0	312	52	595
Norway	2010	260	41	0	0	382	59	642
Norway	2011	302	43	0	0	394	57	696
Norway	2012	255	37	0	0	440	63	696
Norway	2013	192	40	0	0	283	60	475
Norway	2014	213	43	0	0	277	57	490
Norway	2015	233	40	0	0	350	60	583
Norway	2016	269	44	0	0	343	56	612
Norway	2017	290	44	0	0	376	56	666
Norway	2018	323	54	0	0	271	46	594
Norway	2019	219	43	0	0	293	57	513
Russia	1996	64	49	21	16	46	35	131
Russia	1997	63	57	17	15	32	28	111
Russia	1998	55	42	2	2	74	56	131
Russia	1999	48	47	2	2	52	51	102
Russia	2000	64	52	15	12	45	36	124

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Russia	2001	70	61	0	0	44	39	114
Russia	2002	60	51	0	0	58	49	118
Russia	2003	57	53	0	0	50	47	107
Russia	2004	46	56	0	0	36	44	82
Russia	2005	58	70	0	0	25	30	82
Russia	2006	52	57	0	0	39	43	91
Russia	2007	31	50	0	0	31	50	63
Russia	2008	33	45	0	0	40	55	73
Russia	2009	22	31	0	0	49	69	71
Russia	2010	36	41	0	0	52	59	88
Russia	2011	37	42	0	0	52	58	89
Russia	2012	38	46	0	0	45	54	82
Russia	2013	36	46	0	0	42	54	78
Russia	2014	33	41	0	0	48	59	81
Russia	2015	34	42	0	0	46	58	80
Russia	2016	24	42	0	0	32	58	56
Russia	2017	13	28	0	0	34	72	47
Russia	2018	36	45	0	0	44	55	80
Russia	2019	22	38	0	0	35	62	57
Spain	1996	0	0	0	0	7	100	7
Spain	1997	0	0	0	0	4	100	4
Spain	1998	0	0	0	0	4	100	4
Spain	1999	0	0	0	0	6	100	6
Spain	2000	0	0	0	0	7	100	7
Spain	2001	0	0	0	0	13	100	13
Spain	2002	0	0	0	0	9	100	9
Spain	2003	0	0	0	0	7	100	7
Spain	2004	0	0	0	0	7	100	7
Spain	2005	0	0	0	0	13	100	13
Spain	2006	0	0	0	0	11	100	11
Spain	2007	0	0	0	0	9	100	9
Spain	2008	0	0	0	0	9	100	9
Spain	2009	0	0	0	0	2	100	2
Spain	2010	0	0	0	0	2	100	2
Spain	2011	0	0	0	0	7	100	7
Spain	2012	0	0	0	0	7	100	7
Spain	2013	0	0	0	0	5	100	5

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
Spain	2014	0	0	0	0	6	100	6
Spain	2015	0	0	0	0	5	100	5
Spain	2016	0	0	0	0	5	100	5
Spain	2017	0	0	0	0	2	100	2
Spain	2018	0	0	0	0	3	100	3
Spain	2019	0	0	0	0	5	100	5
Sweden	1996	19	58	0	0	14	42	33
Sweden	1997	10	56	0	0	8	44	18
Sweden	1998	5	33	0	0	10	67	15
Sweden	1999	5	31	0	0	11	69	16
Sweden	2000	10	30	0	0	23	70	33
Sweden	2001	9	27	0	0	24	73	33
Sweden	2002	7	25	0	0	21	75	28
Sweden	2003	7	28	0	0	18	72	25
Sweden	2004	3	16	0	0	16	84	19
Sweden	2005	1	7	0	0	14	93	15
Sweden	2006	1	7	0	0	13	93	14
Sweden	2007	0	1	0	0	16	99	16
Sweden	2008	0	1	0	0	18	99	18
Sweden	2009	0	3	0	0	17	97	17
Sweden	2010	0	0	0	0	22	100	22
Sweden	2011	10	26	0	0	29	74	39
Sweden	2012	7	24	0	0	23	76	30
Sweden	2013	0	0	0	0	15	100	15
Sweden	2014	0	0	0	0	30	100	30
Sweden	2015	0	0	0	0	16	100	16
Sweden	2016	0	0	0	0	9	100	9
Sweden	2017	0	0	0	0	16	100	16
Sweden	2018	0	0	0	0	13	100	13
Sweden	2019	0	0	0	0	17	100	17
UK(E & W)	1996	83	45	42	23	58	31	183
UK(E & W)	1997	81	57	27	19	35	24	142
UK(E & W)	1998	65	53	19	16	38	31	123
UK(E & W)	1999	101	67	23	15	26	17	150
UK(E & W)	2000	157	72	25	12	37	17	219
UK(E & W)	2001	129	70	24	13	31	17	184
UK(E & W)	2002	108	67	24	15	29	18	161

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
UK(E & W)	2003	42	47	27	30	20	23	89
UK(E & W)	2004	39	35	19	17	53	47	111
UK(E & W)	2005	32	33	28	29	36	37	97
UK(E & W)	2006	30	37	21	26	30	37	80
UK(E & W)	2007	24	36	13	20	30	44	67
UK(E & W)	2008	22	34	8	13	34	53	64
UK(E & W)	2009	20	37	9	16	25	47	54
UK(E & W)	2010	64	59	9	8	36	33	109
UK(E & W)	2011	93	69	6	5	36	27	136
UK(E & W)	2012	26	45	5	8	27	47	58
UK(E & W)	2013	61	73	6	7	17	20	84
UK(E & W)	2014	41	75	4	8	9	17	54
UK(E & W)	2015	55	82	4	6	8	12	68
UK(E & W)	2016	71	82	6	6	10	11	86
UK(E & W)	2017	36	73	3	7	10	19	49
UK(E & W)	2018	36	84	3	8	4	8	42
UK(E & W)	2019	0	0	1	11	4	89	5
UK(N. Ire)	1999	44	83	9	17	na	na	53
UK(N. Ire)	2000	63	82	14	18	na	na	77
UK(N. Ire)	2001	41	77	12	23	na	na	53
UK(N. Ire)	2002	40	49	24	29	18	22	81
UK(N. Ire)	2003	25	45	20	35	11	20	56
UK(N. Ire)	2004	23	48	11	22	14	29	48
UK(N. Ire)	2005	25	49	13	25	14	26	52
UK(N. Ire)	2006	13	45	6	22	9	32	29
UK(N. Ire)	2007	6	21	6	20	17	59	30
UK(N. Ire)	2008	4	19	5	22	12	59	21
UK(N. Ire)	2009	4	24	2	15	10	62	16
UK(N. Ire)	2010	5	39	0	0	7	61	12
UK(N. Ire)	2011	3	24	0	0	8	76	10
UK(N. Ire)	2012	0	0	0	0	9	100	9
UK(N. Ire)	2013	0	1	0	0	4	99	4
UK(N. Ire)	2014	0	0	0	0	5	100	5
UK(N. Ire)	2015	0	0	0	0	3	100	3
UK(N. Ire)	2016	0	0	0	0	5	100	5
UK(N. Ire)	2017	0	0	0	0	5	100	5
UK(N. Ire)	2018	0	0	0	0	4	100	4

Country	Year	Coastal		Estuarine		In-river		Total
		Tonnes	% of total	Tonnes	% of total	Tonnes	% of total	tonnes
UK(N. Ire)	2019	0	0	0	0	3	100	3
UK(Scot)	1996	129	30	80	19	218	51	427
UK(Scot)	1997	79	27	33	11	184	62	296
UK(Scot)	1998	60	21	28	10	195	69	283
UK(Scot)	1999	35	18	23	11	141	71	199
UK(Scot)	2000	76	28	41	15	157	57	274
UK(Scot)	2001	77	30	22	9	153	61	251
UK(Scot)	2002	55	29	20	10	116	61	191
UK(Scot)	2003	87	45	23	12	83	43	193
UK(Scot)	2004	67	27	20	8	160	65	247
UK(Scot)	2005	62	29	27	12	128	59	217
UK(Scot)	2006	57	30	17	9	119	62	193
UK(Scot)	2007	40	24	17	10	113	66	171
UK(Scot)	2008	38	24	11	7	112	70	161
UK(Scot)	2009	27	22	14	12	79	66	121
UK(Scot)	2010	44	25	38	21	98	54	180
UK(Scot)	2011	48	30	23	15	87	55	159
UK(Scot)	2012	40	32	11	9	73	59	124
UK(Scot)	2013	50	42	26	22	43	36	119
UK(Scot)	2014	41	49	17	20	26	31	84
UK(Scot)	2015	31	45	9	14	28	41	68
UK(Scot)	2016	0	0	10	37	17	63	27
UK(Scot)	2017	0	0	7	27	19	73	26
UK(Scot)	2018	0	0	12	63	7	37	19
UK(Scot)	2019	0	0	2	14	11	86	13
Denmark	2008	0	1	0	0	9	99	9
Denmark	2009	0	0	0	0	8	100	8
Denmark	2010	0	1	0	0	13	99	13
Denmark	2011	0	0	0	0	13	100	13
Denmark	2012	0	0	0	0	12	100	12
Denmark	2013	0	0	0	0	11	100	11
Denmark	2014	0	0	0	0	9	100	9
Denmark	2015	0	0	0	0	9	100	9
Denmark	2016	0	0	0	0	10	100	10
Denmark	2017	0	1	0	0	12	99	12
Denmark	2018	0	1	0	0	11	99	11
Denmark	2019	0	1	0	0	13	99	13

Table 2.1.2.1. Numbers of fish caught and released in rod fisheries along with the % of the total rod catch (released + retained) for countries in the North Atlantic where records are available, 1991–2019. Figures for 2019 are provisional.

Year	Canada (4)		USA		Iceland		Russia (1)		UK (Engalnd & Wales)		UK (Scotland)		Ireland		UK (N. Ireland) (2)		Denmark		Sweden		Norway (3)	
	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch
1991	22167	28	239	50			3211	51														
1992	37803	29	407	67			10120	73														
1993	44803	36	507	77			11246	82	1448	10												
1994	52887	43	249	95			12056	83	3227	13	6595	8										
1995	46029	46	370	100			11904	84	3189	20	12151	14										
1996	52166	41	542	100	669	2	10745	73	3428	20	10413	15										
1997	50009	50	333	100	1558	5	14823	87	3132	24	10944	18										
1998	56289	53	273	100	2826	7	12776	81	4378	30	13464	18										
1999	48720	50	211	100	3055	10	11450	77	4382	42	14849	28										
2000	64482	56	0	-	2918	11	12914	74	7470	42	21072	32										
2001	59387	55	0	-	3611	12	16945	76	6143	43	27724	38										
2002	50924	52	0	-	5985	18	25248	80	7658	50	24058	41										
2003	53645	55	0	-	5361	16	33862	81	6425	56	29170	55										

Year	Canada (4)		USA		Iceland		Russia (1)		UK (Engalnd & Wales)		UK (Scotland)		Ireland		UK (N. Ireland) (2)		Denmark		Sweden		Norway (3)	
	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch
2004	62316	57	0	-	7362	16	24679	76	13211	48	46279	50					255	19				
2005	63005	62	0	-	9224	17	23592	87	11983	56	46165	55	2553	12			606	27				
2006	60486	62	1	100	8735	19	33380	82	10959	56	47669	55	5409	22	302	18	794	65				
2007	41192	58	3	100	9691	18	44341	90	10917	55	55670	61	15113	44	470	16	959	57				
2008	54887	53	61	100	17178	20	41881	86	13035	55	53366	62	13563	38	648	20	2033	71			5512	5
2009	52151	59	0	-	17514	24			9096	58	48436	67	11422	39	847	21	1709	53			6696	6
2010	55895	53	0	-	21476	29	14585	56	15012	60	78459	70	15142	40	823	25	2512	60			15041	12
2011	71358	57	0	-	18593	32			14406	62	65330	73	12688	38	1197	36	2153	55	424	5	14303	12
2012	43287	57	0	-	9752	28	4743	43	11952	65	63628	74	11891	35	5014	59	2153	55	404	6	18611	14
2013	50630	59	0	-	23133	34	3732	39	10458	70	54003	80	10682	37	1507	64	1932	57	274	9	15953	15
2014	41613	54	0	-	13616	41	8479	52	7992	78	37355	82	6537	37	1065	50	1918	61	982	15	20281	19
2015	65440	64	0	-	21914	31	7028	50	8113	79	46837	84	9383	37	111	100	2989	70	647	18	25433	19
2016	68925	65	0	-	22751	43	10793	76	9700	80	50186	90	10934	43	280	100	3801	72	362	17	25198	21
2017	57357	66	0	-	19667	42	10110	77	11255	83	45652	90	12562	45	126	100	4435	69	590	17	25924	21
2018	56011	82	0	-	19409	43	10799	73	6857	88	35066	93	8729	43	3247	49	4613	79	557	19	22024	22
2019	46335	70	0	-	14136	52	12762	74	7990	89	43739	92	7769	48	4106	61	3913	70	678	20	21178	20

Year	Canada (4)		USA		Iceland		Russia (1)		UK (Engalnd & Wales)		UK (Scotland)		Ireland		UK (N. Ireland) (2)		Denmark		Sweden		Norway (3)	
	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch	Total	% of total rod catch
Mean																						
2014-2018	57869	66	0	-	19471	40	9442	66	8783	82	43019	88	9629	41	966	80	3551	70	628	17	23772	20
% change; recent year relative to mean																						
	-20	6	-	-	-27	32	35	13	-9	9	2	5	-19	17	325	-24	10	0	8	16	-11	-1

Key:

1. **Since 2009 data are either unavailable or incomplete, however catch and release is understood to have remained at similar high levels as before.**

2. **Data for 2006–2009, 2014 is for the Department of Culture, Arts and Leisure area only; the figures from 2010 are a total for UK (N.Ireland). Data for 2015, 2016 and 2017 is for R. Bush only.**

3. **The statistics were collected on a voluntary basis, the numbers reported must be viewed as a minimum.**

4. **Released fish in the kelt fishery of New Brunswick are not included in the totals for Canada.**

Table 2.1.3.1. Estimates of unreported catches by various methods in tonnes within national EEZs in the North-East Atlantic, North American and West Greenland Commissions of NASCO, 1987–2019.

Year	Northeast Atlantic	North America	West Greenland	Total
1987	2554	234	-	2788
1988	3087	161	-	3248
1989	2103	174	-	2277
1990	1779	111	-	1890
1991	1555	127	-	1682
1992	1825	137	-	1962
1993	1471	161	< 12	1644
1994	1157	107	< 12	1276
1995	942	98	20	1060
1996	947	156	20	1123
1997	732	90	5	827
1998	1108	91	11	1210
1999	887	133	12.5	1032
2000	1135	124	10	1269
2001	1089	81	10	1180
2002	946	83	10	1039
2003	719	118	10	847
2004	575	101	10	686
2005	605	85	10	700
2006	604	56	10	670
2007	465	-	10	475
2008	433	-	10	443
2009	317	16	10	343
2010	357	26	10	393
2011	382	29	10	421
2012	363	31	10	403
2013	272	24	10	306

Year	Northeast Atlantic	North America	West Greenland	Total
2014	256	21	10	287
2015	298	17	10	325
2016	298	27	10	335
2017	318	25	10	353
2018	277	24	10	311
2019	237	12	10	258
Mean				
2014–2018	289	23	10	322

Notes:

No estimates available for Canada in 2007–2008 and estimates for 2009, 2010, and 2019 are incomplete.

No estimates have been available for Russia since 2008.

Unreported catch estimates are not provided for Spain and St Pierre & Miquelon.

No estimates were available for France for 2018.

Table 2.1.3.2. Estimates of unreported catches by various methods in tonnes by country within national EEZs in the Northeast Atlantic, North American and West Greenland Commissions of NASCO for 2019.

Commission Area	Country	Unreported Catch (t)	Unreported as % of Total North Atlantic Catch (Unreported + Reported)	Unreported as % of National Catch (Unreported + Reported)
NEAC	Denmark	5	0.4	28
NEAC	Finland	3	0.3	12
NEAC	Iceland	1	0.1	2
NEAC	Ireland	4	0.4	9
NEAC	Norway	220	19.5	30
NEAC	Sweden	2	0.1	9
NEAC	UK (E & W)	1	0.1	13
NEAC	UK (N. Ireland)	0.3	0.0	8
NEAC	UK (Scotland)	1	0.1	9
NAC	USA	0	0.0	0
NAC	Canada	12	1.0	11
WGC	Greenland	10	0.9	25
Total Unreported Catch*		258	22.9	
Total Reported Catch of North Atlantic Salmon		869		

*** No unreported catch estimates available for France and Russia in 2019.**

Unreported catch estimates not provided for Spain or Saint Pierre and Miquelon.

Table 2.2.1.1. Production of farmed salmon in the North Atlantic area and in areas other than the North Atlantic (in tonnes round fresh weight), 1980–2019.

Year	North Atlantic Area											Outside the North Atlantic Area						World-wide Total
	Norway	UK (Scot-land)	Faroes	Canada	Ireland	USA	Ice-land	UK (N. Ire-land)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Aus-tralia	Tur-key	Total	
1980	4153	598	0	11	21	0	0	0	0	-	4783	0	0	0	0	0	0	4783
1981	8422	1133	0	21	35	0	0	0	0	-	9611	0	0	0	0	0	0	9611
1982	10 266	2152	70	38	100	0	0	0	0	-	12 626	0	0	0	0	0	0	12 626
1983	17 000	2536	110	69	257	0	0	0	0	-	19 972	0	0	0	0	0	0	19 972
1984	22 300	3912	120	227	385	0	0	0	0	-	26 944	0	0	0	0	0	0	26 944
1985	28 655	6921	470	359	700	0	91	0	0	-	37 196	0	0	0	0	0	0	37 196
1986	45 675	10 337	1370	672	1215	0	123	0	0	-	59 392	0	11	0	10	0	0	59 392
1987	47 417	12 721	3530	1334	2232	365	490	0	0	-	68 089	41	196	0	62	0	299	68 388
1988	80 371	17 951	3300	3542	4700	455	1053	0	0	-	111 372	165	925	0	240	0	1330	112 702
1989	124 000	28 553	8000	5865	5063	905	1480	0	0	-	173 866	1860	1122	1000	1750	0	5732	179 598
1990	165 000	32 351	13 000	7810	5983	2086	2800	<100	5	-	229 035	9478	696	1700	1750	300	13 924	242 959
1991	155 000	40 593	15 000	9395	9483	4560	2680	100	0	-	236 811	14 957	1879	3500	2653	1500	24 489	261 300
1992	140 000	36 101	17 000	10 380	9231	5850	2100	200	0	-	220 862	23 715	4238	6600	3300	680	38 533	259 395
1993	170 000	48 691	16 000	11 115	12 366	6755	2348	<100	0	-	267 275	29 180	4254	12 000	3500	791	49 725	317 000
1994	204 686	64 066	14 789	12 441	11 616	6130	2588	<100	0	-	316 316	34 175	4834	16 100	4000	434	59 543	375 859

Year	North Atlantic Area											Outside the North Atlantic Area						World-wide Total
	Norway	UK (Scot-land)	Faroes	Canada	Ireland	USA	Ice-land	UK (N. Ire-land)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Aus-tralia	Tur-key	Total	
1995	261 522	70 060	9000	12 550	11 811	10 020	2880	259	0	-	378 102	54 250	4868	16 000	6192	654	81 964	460 066
1996	297 557	83 121	18 600	17 715	14 025	10 010	2772	338	0	-	444 138	77 327	5488	17 000	7647	193	107 655	551 793
1997	332 581	99 197	22 205	19 354	14 025	13 222	2554	225	0	-	503 363	96 675	5784	28 751	7648	50	138 908	642 271
1998	361 879	110 784	20 362	16 418	14 860	13 222	2686	114	0	-	540 325	107 066	2595	33 100	7069	40	149 870	690 195
1999	425 154	126 686	37 000	23 370	18 000	12 246	2900	234	0	-	645 590	103 242	5512	38 800	9195	0	156 749	802 339
2000	440 861	128 959	32 000	33 195	17 648	16 461	2600	250	0	-	671 974	166 897	6049	49 000	10 907	0	232 853	904 827
2001	436 103	138 519	46 014	36 514	23 312	13 202	2645	-	0	-	696 309	253 850	7574	68 000	12 724	0	342 148	1 038 457
2002	462 495	145 609	45 150	40 851	22 294	6798	1471	-	0	-	724 668	265 726	5935	84 200	14 356	0	370 217	1 094 885
2003	509 544	176 596	52 526	38 680	16 347	6007	3710	-	300	-	803 710	280 301	10 307	65 411	15 208	0	371 227	1 174 937
2004	563 914	158 099	40 492	37 280	14 067	8515	6620	-	203	-	829 190	348 983	6645	55 646	16 476	0	427 750	1 256 940
2005	586 512	129 588	18 962	45 891	13 764	5263	6300	-	204	-	806 484	385 779	6110	63 369	16 780	0	472 038	1 278 522
2006	629 888	131 847	11 905	47 880	11 174	4674	5745	-	229	-	843 342	376 476	5811	70 181	20 710	0	473 178	1 316 520

Year	North Atlantic Area											Outside the North Atlantic Area						World-wide Total
	Norway	UK (Scotland)	Faroes	Canada	Ireland	USA	Iceland	UK (N. Ireland)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Australia	Turkey	Total	
2007	744 222	129 930	22 305	36 368	9923	2715	1158	-	111	-	946 732	331 042	7117	70 998	25 336	0	434 493	1 381 225
2008	737 694	128 606	36 000	39 687	9217	9014	330	-	51	-	960 599	388 847	7699	73 265	25 737	0	495 548	1 456 147
2009	862 908	144 247	51 500	43 101	12 210	6028	742	-	2126	-	1 122 862	233 308	7923	68 662	29 893	0	339 786	1 462 648
2010	939 575	154 164	45 391	43 612	15 691	11 127	1068	-	4500	-	1 215 128	123 233	8408	70 831	31 807	0	234 279	1 449 407
2011	1 065 974	158 018	60 473	41 448	12 196	6031	1083	-	8500	-	1 353 723	264 349	7467	83 144	36 662	0	391 622	1 745 345
2012	1 232 095	162 223	76 564	52 951	12 440	-	2923	-	8754	-	1 547 950	399 678	8696	79 981	43 982	0	532 337	2 080 287
2013	1 168 324	163 234	75 821	47 649	9125	-	3018	-	16 097	-	1 483 268	492 329	6834	74 673	42 776	0	616 612	2 099 880
2014	1 258 356	179 022	86 454	29 988	9368	-	3965	-	18 675	-	1 585 828	644 459	6368	54 971	41 591	0	747 389	2 333 217
2015	1 303 346	171 722	66 090	48 684	13 116	-	3260	-	3232	8	1 609 458	608 546	10 431	92 926	48 331	0	760 234	2 369 692
2016	1 233 619	162 817	68 271	33 011	16 300	-	8420	-	12 857	5	1 535 300	532 225	8017	90 511	56 115	0	686 868	2 222 168
2017	1 237 762	189 707	71 172	34 945	19 305	-	11 265	-	13 016	25	1 577 197	614 180	6520	85 608	52 580	0	758 888	2 336 085

Year	North Atlantic Area											Outside the North Atlantic Area						World-wide Total
	Norway	UK (Scotland)	Faroes	Canada	Ireland	USA	Iceland	UK (N. Ireland)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Australia	Turkey	Total	
2018	1 278 596	156 025	78 973	36 174	12 200	-	13 448	-	20 216	-	1 595 632	614 180	8326	87 010	52 580	0	762 096	2 357 728
2019	1 361 806	190 499	94 993	36 174	19 300	-	26 957	-	20 734	12	1 750 475	614 180		87 010	52 580	0	753 770	2 504 245
Mean																		
2014-2018	1 262 336	171 859	74 192	36 560	14 058	-	8072	-	13 599	13	1 580 683	602 718	7932	82 205	50 239	0	743 095	2 323 778
% change; recent year relative to mean																		
	8	11	28	-1	37	-	234	-	52	-5	11	2	-100	6	5	-	1	8

Notes:

- **Data for 2019 are provisional for many countries.**
- **Where production figures were not available for 2019, values as in 2018 or 2017 were assumed.**
- **West Coast USA = Washington State, no data for 2019.**
- **West Coast Canada = British Columbia.**
- **Australia = Tasmania.**
- **Source of production figures for non-Atlantic areas: http://www.fao.org/fishery/statistics/global-aquaculture-production/en, 2017 most recent data**
- **Data for UK (N. Ireland) since 2001 and data for East coast USA since 2012 are not publicly available.**
- **Data for Spain first provided in 2019.**

Table 2.2.2.1. Production of ranched salmon in the North Atlantic (tonnes round fresh weight), 1980–2019.

Year	Iceland (1)	Ireland (2)	UK (N. Ireland) River Bush (2,3)	Sweden (2)	Norway various facilities (2)	Total production
1980	8.0			0.8		9
1981	16.0			0.9		17
1982	17.0			0.6		18
1983	32.0			0.7		33
1984	20.0			1.0		21
1985	55.0	16.0	17.0	0.9		89
1986	59.0	14.3	22.0	2.4		98
1987	40.0	4.6	7.0	4.4		56
1988	180.0	7.1	12.0	3.5	4.0	207
1989	136.0	12.4	17.0	4.1	3.0	172
1990	285.1	7.8	5.0	6.4	6.2	310
1991	346.1	2.3	4.0	4.2	5.5	362
1992	462.1	13.1	11.0	3.2	10.3	500
1993	499.3	9.9	8.0	11.5	7.0	536
1994	312.8	13.2	0.4	7.4	10.0	344
1995	302.7	19.0	1.2	8.9	2.0	334
1996	243.0	9.2	3.0	7.4	8.0	271
1997	59.4	6.1	2.8	3.6	2.0	74
1998	45.5	11.0	1.0	5.0	1.0	64
1999	35.3	4.3	1.4	5.4	1.0	47
2000	11.3	9.3	3.5	9.0	1.0	34
2001	13.9	10.7	2.8	7.3	1.0	36
2002	6.7	6.9	2.4	7.8	1.0	25
2003	11.1	5.4	0.6	9.6	1.0	28
2004	18.1	10.4	0.4	7.3	1.0	37
2005	20.5	5.3	1.7	6.0	1.0	35
2006	17.2	5.8	1.3	5.7	1.0	31

Year	Iceland [1]	Ireland [2]	UK (N. Ireland) River Bush [2,3]	Sweden [2]	Norway various facilities [2]	Total production
2007	35.5	3.1	0.3	9.7	0.5	49
2008	68.6	4.4	-	10.4	0.5	84
2009	44.3	1.1	-	9.9	-	55
2010	42.3	2.5	-	13.0	-	58
2011	30.2	2.5	-	19.1	-	52
2012	20.0	5.3	-	8.9	-	34
2013	30.7	2.8	-	4.2	-	38
2014	17.9	2.8	-	6.2	-	27
2015	31.4	4.7	-	6.6	-	43
2016	33.6	3.0	-	3.1	-	40
2017	24.4	2.8	-	10.0	-	37
2018	21.7	3.0	-	4.1	-	29
2019	14.8	3.6	-	8.0	-	26
Mean						
2014-2018	25.8	3.3	-	6.0	-	35
% change; recent year relative to mean						
	-43	10	-	33	-	-25

Notes:

1. **From 1990 to 2000, catch includes fish ranched for both commercial and angling purposes. No com mercial ranching since 2000.**
2. **Total yield in homewater fisheries and rivers.**
3. **The proportion of ranched fish was not assessed between 2008 and 2018 due to a lack of microtag returns.**

Table 2.7.1 Summary of Atlantic salmon tagged and marked in 2019 - 'Hatchery' and 'Wild' juvenile refer to smolts and parr.

		Primary Tag or Mark				
Country	Origin	Microtag	External mark[2]	Adipose clip	Country	Origin
Canada	Hatchery Adult	0	1044	47	432	1 523
	Hatchery Juvenile	0	339	0	0	339
	Wild Adult	0	1527	0	268	1 795
	Wild Juvenile	0	4918	9626	3073	17 617
	Total	**0**	**7828**	**9673**	**3773**	**21 274**
Denmark	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	283 000	0	283 000
	Wild Adult	0	573	0	0	573
	Wild Juvenile	0	500	0	0	500
	Total	**0**	**1073**	**283 000**	**0**	**284 073**
France	Hatchery Adult	0	0	10 000	0	10 000
	Hatchery Juvenile	0	0	0	0	0
	Wild Adult	0	0	0	291	291
	Wild Juvenile	0	0	0	5483	5 483
	Total	**0**	**0**	**10 000**	**5774**	**15 774**
Iceland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	80 448	0	0	0	80 448
	Wild Adult	0	142	0	29	171
	Wild Juvenile	4425	0	0	1533	5958
	Total	**84 873**	**142**	**0**	**1562**	**86 577**
Ireland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	170 097	0	0	0	170 097
	Wild Adult	0	0	0	0	0
	Wild Juvenile	10 183	0	0	3137	13 320
	Total	**180 280**	**0**	**0**	**3137**	**183 417**
Norway	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	7328	0	108 187	115 515

		Primary Tag or Mark				
Country	Origin	Microtag	External mark[2]	Adipose clip	Country	Origin
	Wild Adult	0	451	0	0	451
	Wild Juvenile	0	390	0	22 108	22 498
	Total	**0**	**8169**	**0**	**130 295**	**138 464**
Russia	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	567 430	0	567 430
	Wild Adult	0	1424	0	0	1424
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**1424**	**567 430**	**0**	**568 854**
Spain	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	145 534	0	145 534
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**0**	**145 534**	**0**	**145 534**

[1] **Includes other internal tags (PIT, ultrasonic, radio, DST, etc.)**

[2] **Includes Carlin, spaghetti, streamers, VIE, etc.**

Table 2.7.1 (continued.) Summary of Atlantic salmon tagged and marked in 2019 - 'Hatchery' and 'Wild' juvenile refer to smolts and parr.

		Primary Tag or Mark				
Country	Origin	Microtag	External mark[2]	Adipose clip	Other Internal[1]	Total
Sweden	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	141 628	0	141 628
	Wild Adult	0	0	0	0	0
	Wild Juvenile	499	0	0	0	499
	Total	499	0	141 628	0	142 127
UK (England &	Hatchery Adult	0	0	0	0	0
Wales)	Hatchery Juvenile	0	0	4960	0	4960
	Wild Adult	0	360	0	0	360
	Wild Juvenile	4 022	0	10 184	169	14 375
	Total	**4 022**	**360**	**15 144**	**169**	**19 695**
UK (N. Ireland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	12 300	0	31 279	0	43 579
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**12 300**	**0**	**31 279**	**0**	**43 579**
UK (Scotland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	47 568	0	47 568
	Wild Adult	0	336	0	7	343
	Wild Juvenile	0	0	0	12 436	12 436
	Total	**0**	**336**	**47 568**	**12 443**	**60 347**
Germany	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	119 030	0	119 030
	Wild Adult	0	0	1	0	1
	Wild Juvenile	0	0	16	349	365
	Total	**0**	**0**	**119 047**	**349**	**119 396**
Greenland[3]	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	20	0	4	24

		Primary Tag or Mark				
Country	Origin	Microtag	External mark[2]	Adipose clip	Other Internal[1]	Total
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**20**	**0**	**4**	**24**
USA	Hatchery Adult	0	0	0	2410	2410
	Hatchery Juvenile	0	0	362 836	508	363 344
	Wild Adult	0	19	34	1167	1220
	Wild Juvenile	0	0	0	114	114
	Total	**0**	**19**	**362 870**	**4199**	**367 088**
All Countries	Hatchery Adult	0	1044	10 047	2842	13 933
	Hatchery Juvenile	262 845	7687	1 703 265	108 699	2 082 496
	Wild Adult	0	4832	35	1762	6629
	Wild Juvenile	19 129	5808	19 826	48 402	93 165
	Total	**281 974**	**19 371**	**1 733 173**	**161 705**	**2 196 223**

[1] **Includes other internal tags (PIT, ultrasonic, radio, DST, etc.)**

[2] **Includes Carlin, spaghetti, streamers, VIE etc.**

[3] **Individuals tagged in Greenland by Atlantic Salmon Federation, details within Canada's Tag report.**

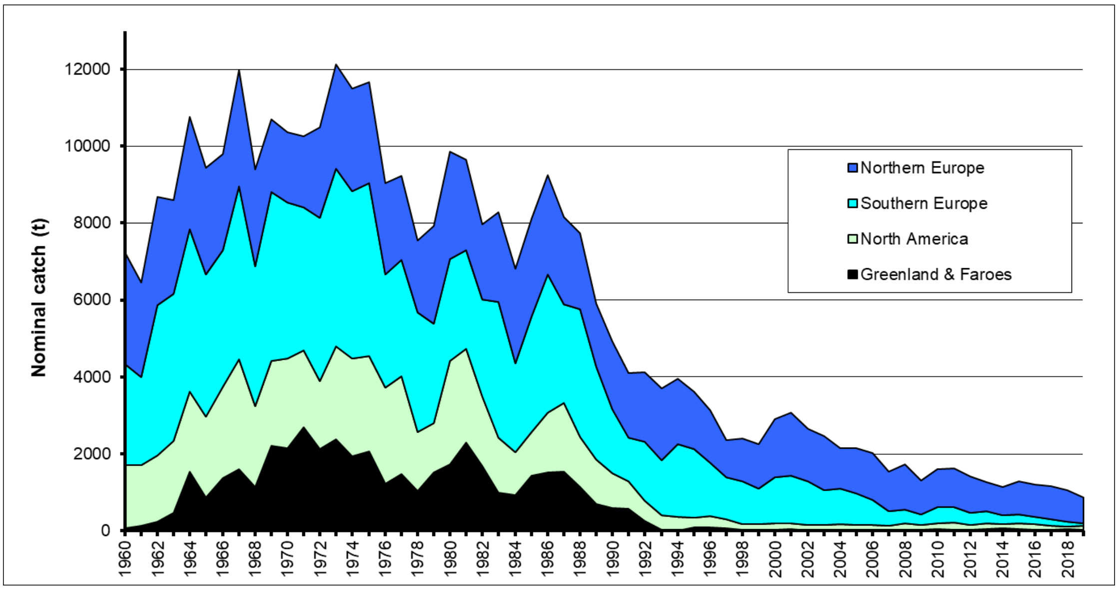


Figure 2.1.1.1. (a) Total reported nominal catches of salmon (tonnes round fresh weight) in four North Atlantic regions, 1960–2019.

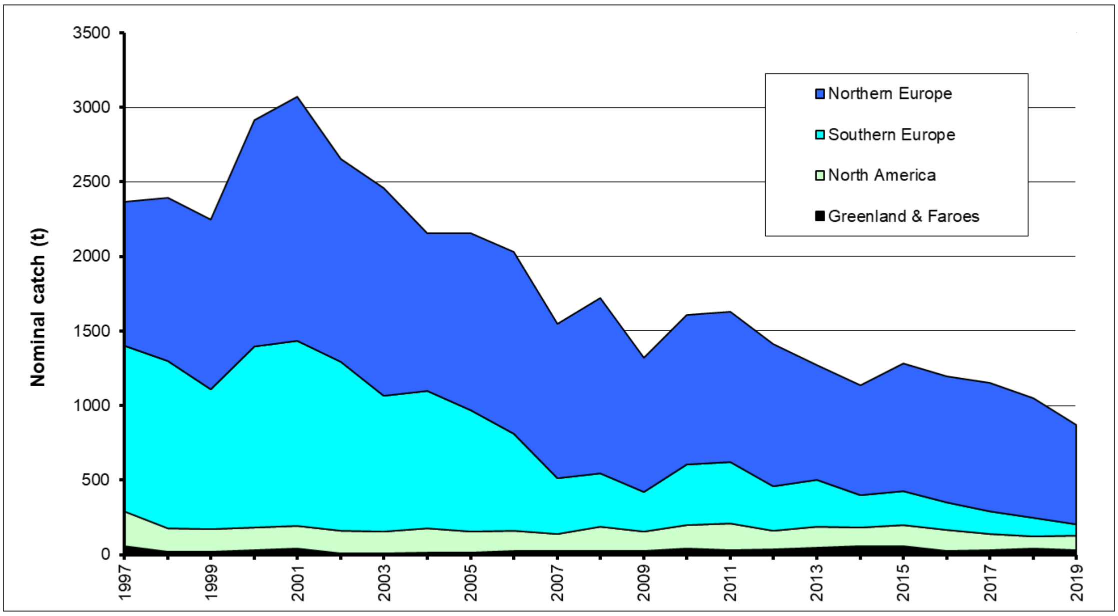


Figure 2.1.1.1. (b) Total reported nominal catches of salmon (tonnes round fresh weight) in four North Atlantic regions, 1997–2019.

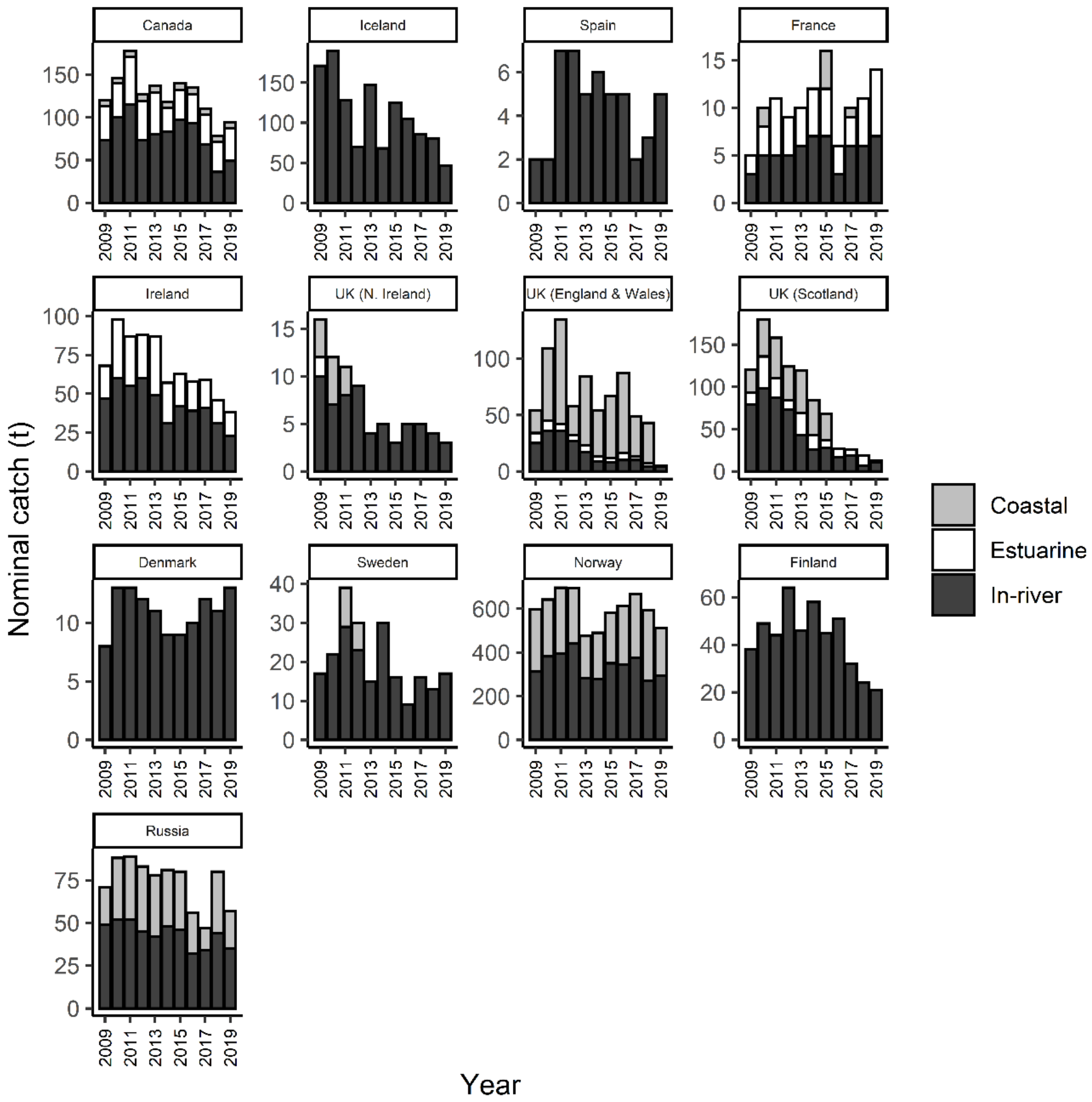


Figure 2.1.1.2. Nominal catch (tonnes round fresh weight) taken in coastal, estuarine and in-river fisheries by country, 2009–2019. The way in which the nominal catch is partitioned among categories varies between countries, particularly for estuarine and coastal fisheries, see text for details. Note also that the y-axes scales vary.

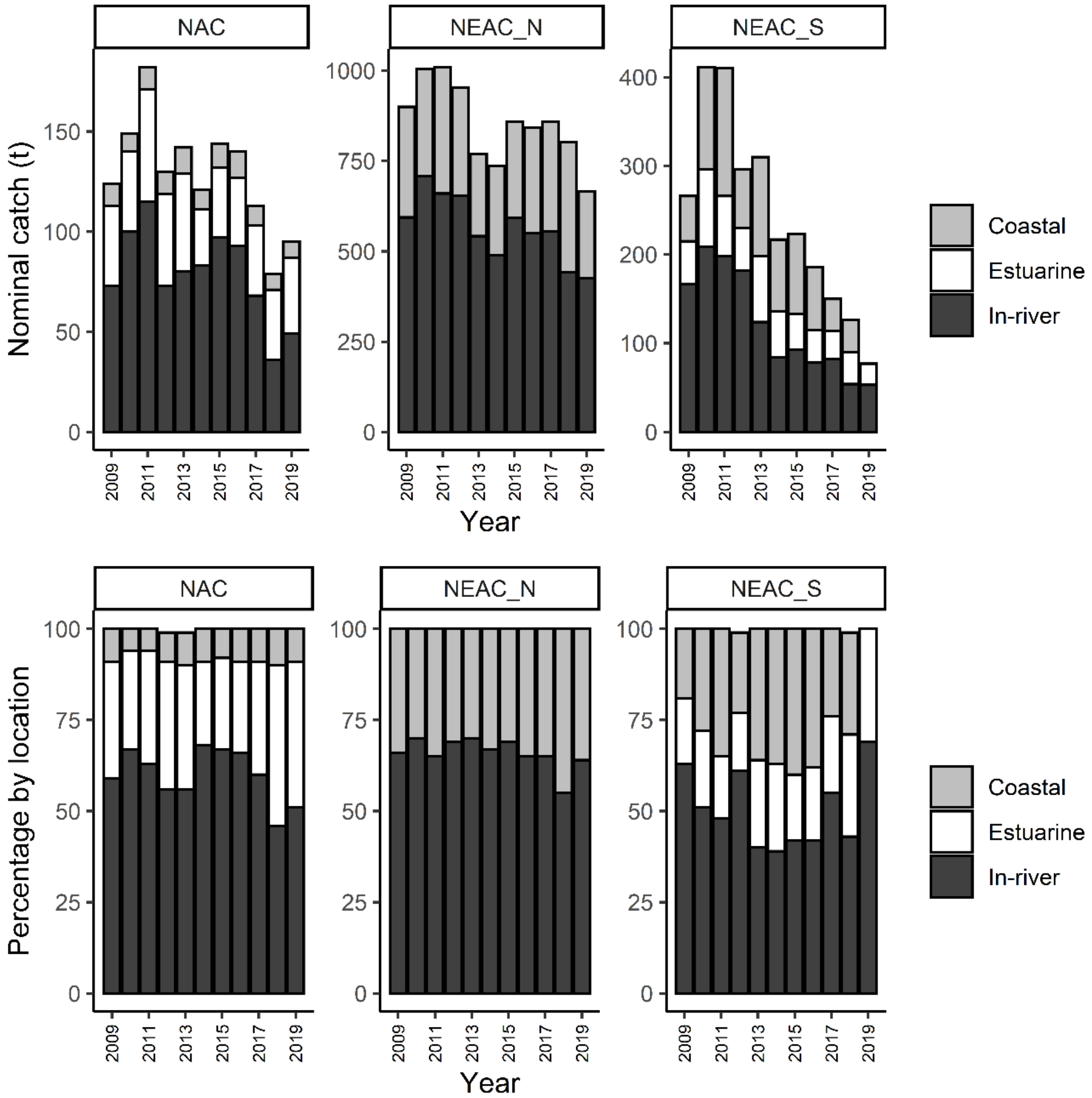


Figure 2.1.1.3. Top panel - Nominal catches (tonnes round fresh weight) taken in coastal, estuarine and in-river fisheries for the NAC area (2009–2019) and for NEAC Northern (NEAC_N) and Southern (NEAC_S) areas (2009–2019). Bottom panel - Percentages of nominal catch taken in coastal, estuarine and in-river fisheries in each commission area, 2009–2019. Note that y-axes in the top panel vary.

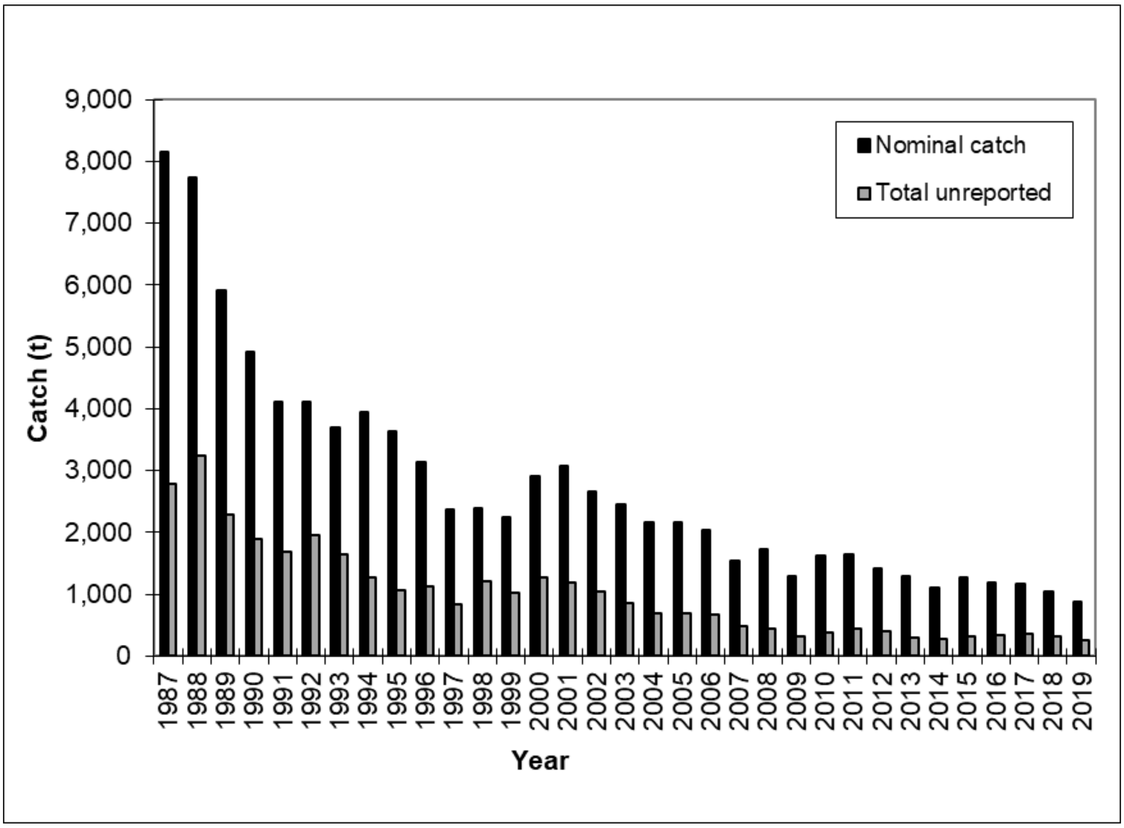


Figure 2.1.3.1. Nominal North Atlantic salmon catch (tonnes round fresh weight) and unreported catch (tonnes round fresh weight) in NASCO Areas, 1987–2019.

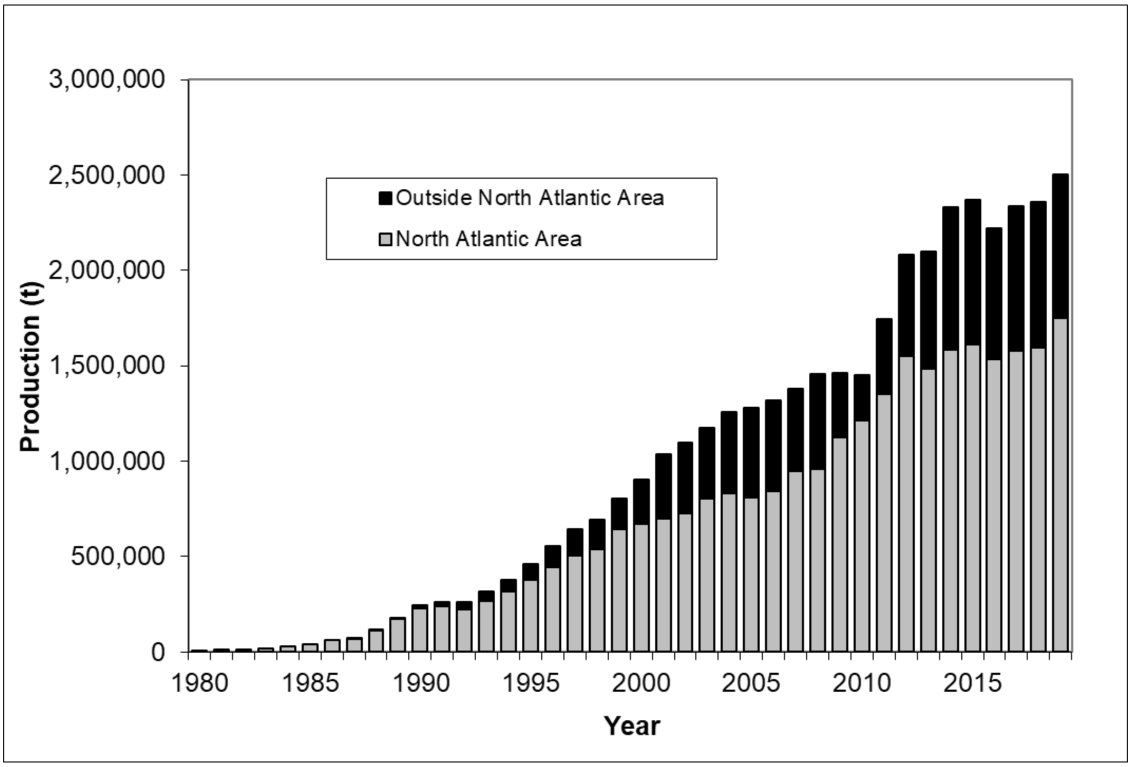


Figure 2.2.1.1. World-wide farmed Atlantic salmon production (tonnes round fresh weight) 1980–2019. Note no data available for USA West coast production at time of writing.

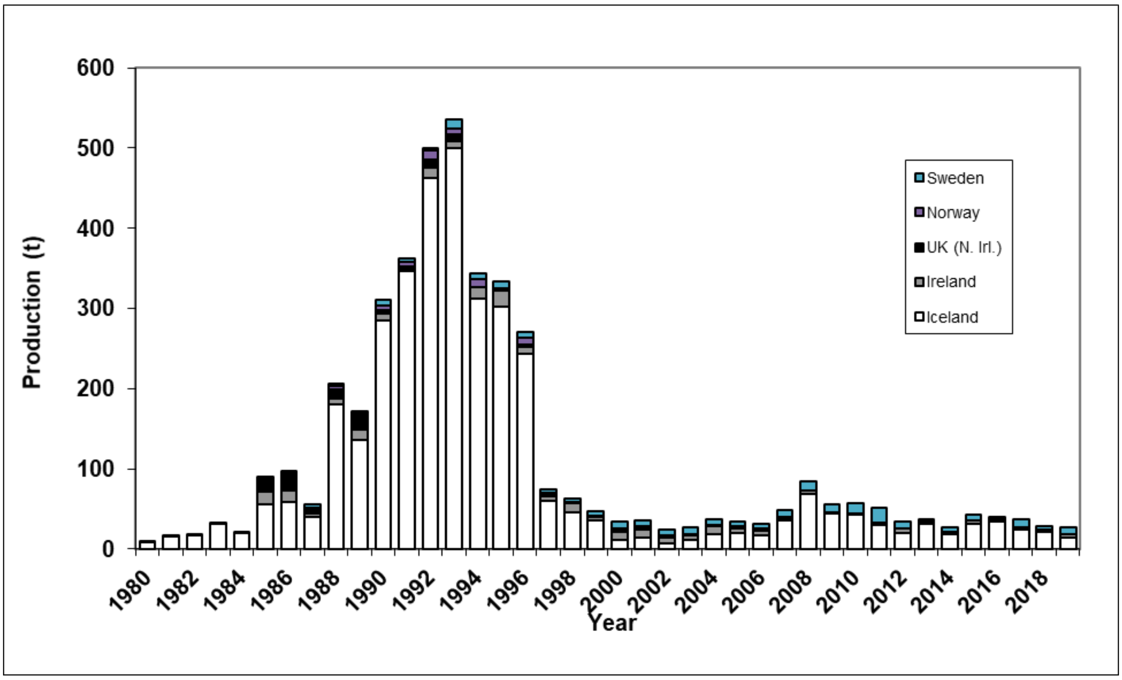


Figure 2.2.2.1. Production of ranched salmon (tonnes round fresh weight) in the North Atlantic, 1980–2019.

Figure 2.3.1.1. Photographs from Inland Fisheries Ireland showing the external haemorrhaging on the underside of adult Atlantic salmon reported in 2019.

3 Northeast Atlantic Commission area

3.1 NASCO has requested ICES to describe the key events of the 2019 fisheries

In 2018, ICES advised that there were no mixed-stock fisheries options on the NEAC stock complexes at the Faroe Islands for the fishing seasons 2018/2019 to 2020/2021 (ICES, 2018). NASCO subsequently agreed a multiannual (three year) decision for the Faroese fishery stipulating not to set a quota for these seasons. The measure for 2019/2020 and 2020/2021 was predicated on the application of a Framework of Indicators (FWI) to provide an annual check that there had been no substantive change in the forecasts of abundance. When the FWI was applied in January 2020, there was no indication that the forecast estimates of abundance for the three stock complexes in the FWI had been underestimated. There was, therefore, no need for a full reassessment by ICES in 2020.

3.1.1 Fishing at Faroe Islands

No fishery for salmon has been prosecuted since 2000.

3.1.2 Key events in NEAC homewater fisheries

New regulatory provisions approved for England in December 2018 have substantially reduced the exploitation of salmon in 2019. The measures included the closure of most net fisheries including all driftnet fisheries and mandatory release of salmon caught in net fisheries authorised to operate for sea trout.

3.1.3 Gear and effort

No significant changes in gear type used were reported in 2019, however, changes in effort were recorded. The number of gear units licensed or authorised in several of the NEAC area countries provides a partial measure of effort (Table 3.1.3.1), but does not take into account other restrictions, for example, closed seasons. In addition, there is no indication from these data of the actual number of licences actively utilised or the time each licensee fished.

The numbers of gear units used to take salmon with nets and traps have declined markedly over the available time-series in all NEAC countries. This reflects the closure of many fisheries and increasingly restrictive measures to reduce levels of exploitation in many countries. There are fewer measures of effort in respect of in-river rod fisheries, and these indicate differing patterns over available time-series. However, anglers in all countries are increasingly practicing catch and release (see below).

Trends in effort are shown in Figures 3.1.3.1 and 3.1.3.2 for the Northern and Southern NEAC countries respectively. In the Northern NEAC area, driftnet effort in Norway accounted for the majority of the effort expended in the early part of the time-series. However, this fishery closed in 1989, reducing the overall effort substantially. The number of bagnets and bendnets in Norway has decreased for the past 15–20 years but in 2019, there were slight increases in the numbers of both bagnets and bendnet from the previous year. The number of gear units in the coastal fishery in the Archangelsk region, Russia, has been relatively stable but increased again in 2018 and 2019 after the lowest number in the time-series in 2017. The number of units in the in-river fishery at the Archangelsk region decreased markedly between 1996 and 2002 but has since remained relatively stable. The number of units was the lowest in the time-series in 2019 with only 25 units, which is almost 60% less than the previous five years.

The numbers of gear units licensed in UK (England and Wales) and Ireland (Table 3.1.3.1) were among the lowest reported in the time-series. In UK (England and Wales), many of the net and fixed engine fisheries were closed and others restricted to mandatory release of salmon in 2019 following the introduction of the National Salmon and Sea Trout Protection byelaws. In UK (Scotland) the numbers of fixed engines and net and cobles were the lowest in the time-series. For UK (Northern Ireland) driftnet, draftnet, bagnets and boxes decreased throughout the time-series and no commercial fishing activity has occurred in coastal Northern Irish waters since 2012. In France, the number of nets in estuaries remained the same (20) since 2014, with similar numbers of commercial nets in freshwater for the last four years.

Rod effort trends, where available, have varied for different areas across the time-series (Table 3.1.3.1). In the Northern NEAC area, the number of anglers and fishing days in Finland showed a dramatic decrease in 2017 following a new fishery agreement between Finland and Norway with the number of fishing days decreasing in River Teno/Tana from 31 923 in 2016 to approximately 10 000 in the last three years. In the Southern NEAC area, rod licence numbers increased from 2001 to 2011 in UK (England & Wales), and there was a marked increase in numbers in 2017 due to the introduction of a new free licence for young fishers (18 years or younger). There was a drop in the annual licence sales in 2019, but short-term licence sales were at similar levels to the previous year. In Ireland, there was an increase in the early 1990s owing to the introduction of one-day licences. In France, the rod-and-line effort in freshwater has been stable throughout the time period, with a small decrease in 2019 licence numbers compared to the previous year.

3.1.4 Catches

NEAC area catches are presented in Table 3.1.4.1. The provisional nominal catch in the NEAC area in 2019 (743 t) was 217 t below the updated catch for 2018 (960 t), 26% and 35% below the previous five-year and ten-year means, respectively. It should be noted that changes in nominal catch may reflect changes in exploitation rates and the extent of catch and release in rivers, in addition to stock size, and thus cannot be regarded as a direct indicator of change in abundance. The provisional total nominal catch in Northern NEAC in 2019 (666 t) was lower than the updated catch for 2018 (824 t) and the previous five-year and ten-year means (826 t, 904 t, respectively). In the Southern NEAC area the provisional total nominal catch for 2019 (77 t) is the lowest in the time-series, well below the updated catch for 2018 (136 t), 57% and 70% below the previous five-year and ten-year means respectively. The greatest reduction in catch in Southern NEAC was observed in UK (England and Wales) where the catch in 2019 (5 t) was 12% of the catch in 2018 (42 t). The reduction is largely a result of the closure of almost all net fisheries in this area.

Figure 3.1.4.1 shows the trends in nominal catches of salmon in the Southern and Northern NEAC areas from 1971 to 2019. The catch in the Southern NEAC area has declined over the period from about 4500 t in 1972 to 1975 to below 1000 t since 2003. The catch fell sharply in 1976, and between 1989 and 1991, and has shown a steady decline over the last 15 years from over 1000 t to below 100 t at present. The catch in the Northern NEAC area declined over the time-series, although less than in the Southern NEAC area. The catch in the Northern NEAC area varied between 2000 t and 2800 t from 1971 to 1988, fell to a low of 962 t in 1997, then increased to over 1600 t in 2001, then declined again thereafter and has been below 1000 t since 2012. Thus, the catch in the Southern NEAC area, which comprised around two-thirds of the total NEAC catch in the early 1970s, has been lower than that in the Northern NEAC area since 1999, and has been around one-fifth of the total catch in the NEAC area in recent years.

3.1.5 Catch per unit of effort (cpue)

Cpue can be influenced by various factors, such as fishing conditions, perceived likelihood of success and experience. Both cpue of net and rod fisheries might be affected by measures taken to reduce fishing effort, for example, changes in regulations affecting gear. Cpue may be affected by increasing rates of catch and release in rod fisheries. If changes in one or more factors occur, a pattern in cpue may not be immediately evident, particularly over larger areas. It is, however, expected that for a relatively stable effort, cpue can reflect changes in the status of stocks and stock size.

The cpue data are presented in Tables 3.1.5.1 to 3.1.5.6. The cpue data for rod fisheries have been derived by relating the catch to rod days or angler season. Cpue data for net fisheries were calculated as catch per licence-day, gear-day, licence-tide, trap-month or crew-month.

In the Southern NEAC area, UK (England and Wales) closed most net fisheries (except in Wales) for 2019 (Table 3.1.5.3). The Cpue data for the net and coble fisheries in UK (Scotland) show a general decline over the time-series. After an increase in 2018, the cpue value decreased substantially in 2019 (Table 3.1.5.5). The Cpue data for the fixed engine fisheries (excluding those from the Solway region) has shown a slight increase since 2010, but since 2016 there has been zero effort due to fishery regulations (Table 3.1.5.5). The cpue values for rod fisheries in UK (England and Wales) show a general positive trend (Figure 3.1.5.1) but declined from 2018 to 2019 (Table 3.1.5.4).

In the Northern NEAC area, the cpue data for the commercial coastal net fisheries in the Archangelsk area, Russia, showed a general decrease, but the cpue for the Archangelsk in-river fishery has shown a general increase (Figure 3.1.5.1 and Table 3.1.5.2). Other Russian river fisheries showed 2019 cpue values that were mostly higher than in the previous year and above the means of the previous five years (Table 3.1.5.2) and the overall trend shows a small increase across the time-series (Figure 3.1.5.1). In Finland, the cpue per angler-season in the rivers Teno and Näätämöjoki has been relatively stable over time (Figure 3.1.3.1). After the major change in fishery regulation on the Teno, the 2017 figures were much higher than in the previous year and the five-year means, but were at lower levels again in 2018 and 2019 (Table 3.1.5.1). For the River Näätämöjoki, cpue values for 2019 were higher than in the previous year and the long-term and five-year means. A general positive trend was observed for the cpue in the Norwegian net fisheries (Figure 3.1.5.1), but most values in 2019 were lower than in the previous year or the long-term means both for bagnets and bendnets (Table 3.1.5.6).

3.1.6 Age composition of catches

The percentage of 1SW salmon in NEAC catches is presented by country in Table 3.1.6.1 and shown separately for Northern and Southern NEAC countries in Figure 3.1.6.1. Except for Iceland, the proportion of 1SW salmon has declined for all countries over the period 1987–2019. The decline in the proportion of 1SW salmon is evident in both stock complexes, particularly after 2000 (Figure 3.1.6.1).The overall percentage of 1SW fish in Northern NEAC catches remained reasonably consistent in the period 1987–2000 (mean 66%, range 61% to 72%), but has fallen in more recent years (2001–2019) to 57% (range 48% to 69%), when greater variability among countries and years has also been evident. Comparing the two periods, the proportion of 1SW fish has decreased in Russia, Norway, Finland, and Sweden, whereas an increase is apparent for Iceland. On average, 1SW fish comprise a higher percentage of the catch in Iceland than in the other Northern NEAC countries in the period 2001–2019, this may be related to increased catch and release of MSW fish in Iceland (Table 3.1.6.1).

In the Southern NEAC area, the percentage of 1SW fish in catches averaged 60% (range 49% to 64%) in 1987–2000 and 55% (range 45% to 63%) in 2001–2019. Comparing the two periods, the percentage of 1SW salmon has decreased in all Southern NEAC countries presented (Table 3.1.6.1), especially so for Spain.

3.1.7 Farmed and ranched salmon in catches

The contribution of farmed and ranched salmon to national catches in the NEAC area in 2019 was again generally low in most countries, with the exception of farmed salmon in Norway and ranched in Iceland and Sweden. Farmed and ranched fish are included in assessments of the status of national stocks (Section 3.3) for Norway.

The number of farmed salmon that escaped from Norwegian farms in 2019 was reported to be approximately 271 000 fish (provisional figure), substantially up from the previous year (159 000). An assessment of the likely effect of these fish on the estimates of PFA has been reported previously (ICES, 2001).

The estimated proportion of farmed salmon in Norwegian angling catches in 2019 was at the lower end of the range (3%) in the time-series, whereas the proportion in samples taken from Norwegian rivers in autumn (7%) increased from the record low values in the previous two years (4%). No data are available for the proportion of farmed salmon in coastal fisheries in Norway. A small number of escaped farmed salmon (6) was also reported from catches in Icelandic rivers in 2019, and all of them were genetically traced back to the cages from which they had escaped. A small number (20) of farmed salmon were also reported in catches by all methods from UK (Scotland).

The release of smolts for commercial ranching purposes ceased in Iceland in 1998, but ranching for rod fisheries in two Icelandic rivers continued in 2019. Icelandic catches have traditionally been split into two separate categories, wild and ranched (Table 2.1.1.1). In 2019, 14.8 t of catch were reported as ranched salmon in contrast to 30.8 t harvested as wild. Similarly, Swedish catches have been split into two separate categories, wild and ranched (Table 2.1.1.1). In 2019, 7.7 t of catch were reported as ranched salmon in contrast to 9.2 t harvested as wild. Ranching occurs on a much smaller scale in Ireland and UK (Northern Ireland).

3.1.8 National origin of catches

3.1.8.1 Catches of Russian salmon in northern Norway

A mixed-stock Atlantic salmon fishery operates off the coast of northern Norway, in the three northernmost counties: Nordland, Troms and Finnmark. Annual landings in these counties in the last ten years varied between 114 and 165 t, with most catches taken in Finnmark (Statistics Norway). Different salmon stocks from Norwegian, Finnish and Russian rivers migrate along the coastal areas at the time when the fishery operates.

The Working Group has previously reported on investigations of the coastal fisheries in northern Norway where genetic methods have been applied to analyse the stock composition of this mixed-stock fishery (ICES, 2015b) based on results from the Kolarctic Salmon project (Kolarctic ENPI CBC programme 2007–2013). Overall, the incidence of Russian salmon in the coastal catches varied strongly within season and among fishing regions, averaging 17% for 2011–2012 in the coastal catches in Finnmark County, while nearly 50% of all salmon captured in Varangerfjord, close to the border, were of Russian origin. Catches in May and June were composed of salmon from wider geographical areas, whereas catches in July and August contained more salmon from local populations (Niemelä *et al.*, 2014). However, it should be noted that these estimated proportions of Russian salmon in the catches are based on the extended season permitted for the research fishery in the Kolarctic Salmon project. Proportions of Russian salmon are likely to be different in the regular fishing season, especially since the proportion of Russian salmon was highest in the early period of the research fishery, when there was no regular fishery.

In autumn 2015, the Russian Federation and Norway signed the Memorandum of Understanding between the Ministry of Climate and Environment (Norway) and the Federal Agency for Fishery (the

Russian Federation) on cooperation in management of, and monitoring and research on, wild Atlantic salmon in Finnmark County (Norway) and the Murmansk region (the Russian Federation). The Working Group on Atlantic salmon in Finnmark County and the Murmansk Region consisting of managers and scientists from each country as appointed by Parties was established under the MoU.

The first report of the Group "Status and Management of Salmon Stocks in Finnmark County and the Murmansk Region" was prepared in 2018 and sent to the Ministry of Climate and Environment (Norway) and the Federal Agency for Fishery (the Russian Federation). The group met in Murmansk in March 2019, and the second report is in progress focusing on the effects of the recent changes in marine fishery efforts in Finnmark. The next meeting is planned for August 2020.

3.1.9 Exploitation indices of NEAC stocks

Exploitation rates have been plotted for 1SW and MSW salmon from the Northern NEAC (1983 to 2019) and Southern NEAC (1971 to 2019) areas and are displayed in Figure 3.1.9.1. National exploitation rates are an output of the NEAC PFA Run Reconstruction Model. These were combined, as appropriate, by weighting each individual country's exploitation rate to the reconstructed returns. Data gathered prior to the 1980s represent estimates of national exploitation rates while post-1980s exploitation rates have often been subject to more robust analysis informed by projects such as the national coded wire-tag programme in Ireland.

The exploitation of 1SW salmon in both Northern NEAC and Southern NEAC areas has shown a general decline over the time-series (Figure 3.1.9.1), with a notable sharp decline in 2007 as a result of the closure of the Irish driftnet fisheries in the Southern NEAC area. The weighted exploitation rate on 1SW salmon in the Northern NEAC area was 42% in 2019, which was at the same level as the previous five-year (42%) and ten-year (41%) means. Exploitation on 1SW fish in the Southern NEAC complex was 6% in 2019, which was lower than the previous five-year (11%) and the ten-year (12%) means.

The exploitation rate of MSW fish also exhibited an overall decline over the time-series in both Northern NEAC and Southern NEAC areas (Figure 3.1.9.1). Exploitation on MSW salmon in the Northern NEAC area was 43% in 2019, which was slightly lower than the previous five-year (44%) and the ten-year (45%) means. Exploitation on MSW fish in Southern NEAC was 4% in 2019, which was lower than the previous five-year (11%) and ten-year (12%) means.

The rates of change of exploitation of 1SW and MSW salmon in NEAC countries over the available time periods are shown in Figure 3.1.9.2. These were derived from the slope of the linear regression between time and natural logarithm transformed exploitation rate. The relative rate of change of exploitation over the entire time-series indicates an overall reduction of exploitation in most Northern NEAC countries for 1SW and MSW salmon (Figure 3.1.9.2). Exploitation in Finland has been relatively stable over the time period, whereas the largest rate of reduction has been for MSW salmon in Iceland (Northeast), and for 1SW salmon in Russia. The Southern NEAC countries have also shown a general decrease in exploitation rates (Figure 3.1.9.2) on both 1SW and MSW components. The greatest rate of decrease shown for 1SW fish was in UK (Scotland) and (UK (Northern Ireland), while France (MSW) and Iceland (both 1SW and MSW) showed relative stability in exploitation rates during the time-series. Exploitation for 1SW salmon in France shows an increase over the time-series.

3.2 Management objectives and reference points

3.2.1 NEAC conservation limits

River-specific Conservation Limits (CLs) have been derived for salmon stocks in most countries in the NEAC area (France, Ireland, UK (England and Wales), UK (Northern Ireland), Finland, Norway and

Sweden) and these are used in national assessments. In these cases, CL estimates for individual rivers are summed to provide estimates at the national level for these countries.

River-specific CLs have also been derived for salmon stocks in UK (Scotland) and for a number of rivers in Russia and Iceland, but these are not yet used in national assessments. An interim approach has been developed for countries that do not use river-specific CLs in their national assessment. This approach is based on the establishment of pseudo stock–recruitment relationships for national salmon stocks; further details are provided in the Stock Annex (Annex 6).

The CL estimates for all individual countries are summed to provide estimates for the Northern and Southern NEAC stock complexes (Table 3.2.1.1). These data are also used to estimate the Spawner Escapement Reserves (SERs; the CL increased to take account of natural mortality between the recruitment date of 1 January in the first sea winter and return to home waters). SERs are estimated for maturing and non-maturing 1SW salmon from individual countries as well as for the Northern NEAC and Southern NEAC stock complexes (Table 3.2.1.1). The Working Group considers that the current national CL and SER levels may be less appropriate for evaluating the historical status of stocks (e.g. pre-1985), which in many cases have been estimated with less precision.

3.2.2 Progress with setting river-specific conservation limits

3.2.2.1 Iceland

A CL was set for the River Gljufurá, a tributary to River Hvita, West Iceland in 2018. In 2019, CLs were estimated for 11 more rivers, all of which are important salmon fisheries, mostly in West Iceland, that contribute around 33% of the total annual rod catch of wild salmon. Juvenile surveys will be used to calculate the relationship between the spawning stock and recruitment, with rod catch statistics used to transfer CLs between rivers of similar productive capacity.

In the Salmonids Fisheries Act (2006), the laws enforce a responsibility of fishing rights owners to harvest their fish stocks sustainably. Each Fishery Association must make a harvest plan for their river. It is expected that the harvest plans would facilitate the setting of CLs as a basis for sustainable fisheries in each river. However, it is noted that the necessary legal obligation for compliance for Fishery Associations, as the major stakeholders, is not in hand. That process is likely to take a few more years before being fully adopted. Until this work has been completed, the pseudo stock–recruitment relationship approach will continue to be used.

3.2.2.2 UK (Scotland)

In 2019, a national assessment of the status of salmon stocks was undertaken at the scale of the river, or on groups of small neighbouring rivers where rod fishery data were not yet available by river. In addition, the status of stocks associated with Special Areas of Conservation (SACs), designated under the European Union's Habitats Directive due to their importance for salmon, is assessed separately. A total of 173 assessable areas were identified in 2019 and informed the basis of management measures implemented in 2020.

In 2018, Bayesian hierarchical modelling methods (Prévost *et al.*, 2003; White *et al.*, 2016) were developed to derive egg requirements (CLs) for Scottish stocks with adult to adult stock–recruitment data and to transport them to all assessable areas without such data. This approach takes into account wetted area and geographic location when transporting CLs. The same process was used to derive CLs for all assessable areas in the 2019 national assessment (for the 2020 season).

3.3 Status of stocks

3.3.1 The NEAC PFA run–reconstruction model

The Working Group uses a run–reconstruction model to estimate the PFA of salmon from countries in the NEAC area (Potter *et al.*, 2004). PFA in the NEAC area is defined as the number of 1SW recruits on 1 January in their first winter at sea. The model is generally based on the annual retained catches in numbers of 1SW and MSW salmon in each country, which are raised to take account of minimum and maximum estimates of non-reported catches and exploitation rates of these two sea-age groups. These values are then raised further to take account of the natural mortality between 1 January in the first sea winter and the mid-date of return of the stocks to freshwater.

Where the standard input data are themselves derived from other data sources, the raw data may be included in the model to permit the uncertainty in these analyses to be incorporated into the modelling approach. Some countries have developed alternative approaches to estimate the total returning stock, and the Working Group reports these changes and the associated data inputs in the year in which they are first implemented.

For some countries, the data are provided in two or more regional blocks. In these instances, model output is provided for the regional blocks and is combined to provide stock estimates for the country as a whole. The input data for Finland comprise the total Finnish and Norwegian catches (net and rod) for the River Teno/Tana, and the Norwegian catches from this river are not included in the input data for Norway.

A Monte Carlo simulation (9999 resamples) is used to estimate confidence intervals on the stock estimates. Further details of the model are provided in the Stock Annex, including a step-by-step walkthrough of the modelling process.

3.3.2 Changes to the national input data for the NEAC PFA run–reconstruction model

Model inputs are described in detail in Section 2.2 of the Stock Annex. In addition to adding new data for 2019, the following changes were made to the national/regional input data for the model:

UK (England and Wales): Several changes were made to the UK (England and Wales) run–reconstruction model inputs due to substantially reduced net catches in 2019, resulting from the introduction of National Salmon and Sea Trout Protection byelaws closing many net fisheries. As a result of these new regulatory provisions, the retained net catch in 2019 was too low to derive reliable abundance estimates for the current year in the run–reconstruction model.

For 2019, abundance was estimated from reported rod and net catch (retained and released) rather than retained catch as in previous years. To raise the reported catch to estimates of home water returns for both 1SW and MSW salmon, we used correction factors. The correction factors were estimated, using linear weighted least squares regression, from the relationship between rod and net catch rates (total catch/effort) and estimated home water returns in the period 1999 to 2018. Specifically, the regression model was as follows:

$$R_{1SW} = \beta_{rod} x_{rod} + \beta_{net} x_{net} + e,$$
$$x_{rod} = P_{1SW}\, C_{rod}/E_{rod}\,,$$
$$x_{net} = P_{1SW}\, C_{net}/E_{net}\,,$$

where R_{1SW} is the number of 1SW returns, β_{rod} and β_{net} are the regression coefficients relating explanatory variables x_{rod} and x_{net} to R_{1SW}, P_{1SW} is the proportion of 1SW fish in the returns, C_{rod} and C_{net} are the total catches by rod and net, respectively, E_{rod} and E_{net} is the effort by rod and net, respectively, and e is the residual term. The inverse of the error variances of R_{1SW} were used as weights in the regression. The correction factors were then given by the coefficients β_{rod} and β_{net} for rod and net catch, respectively. The correction factor uncertainties were given by the estimated standard errors (SE) of the coefficients. Correction factors and their uncertainties were used as parameters of a uniform distribution defined as $\mathrm{U}(\beta_{rod} - 6.7\beta_{rodSE},\ \beta_{rod} + 6.7\beta_{rodSE})$, and similarly for the net correction factor. The value of 6.7 was chosen to fit the average uncertainty (coefficient of variation) as estimated by the run–reconstruction model in the return rates in the same time period. The same model was fitted for the MSW fish. All the input data previously used were unchanged. The Working Group agreed that a review of the input data for UK (England and Wales) was required, particularly as retained net catch used to estimate abundance is declining both as absolute numbers and as a proportion of the total catch. This situation is also faced by other countries and jurisdictions.

3.3.3 Changes to the NEAC PFA run–reconstruction model

UK (England and Wales): To accommodate revisions to the data inputs described above, the number of returns for 2019 were based on total rod and net catch multiplied by correction factors that included estimates of uncertainty. The exploitation rates for 2019 were then derived from estimated returns and retained catch (reported and unreported), rather than being an input to the model as in previous years.

3.3.4 Description of national stocks and NEAC stock complexes as derived from the NEAC run–reconstruction model

The NEAC PFA run–reconstruction model provides an overview of the status of national salmon stocks in the Northeast Atlantic. It does not capture variations in the status of stocks in individual rivers or small groups of rivers, although this has been addressed, in part, by the regional splits within some countries and the analysis set out in Section 3.3.5.

The model output for each country has been displayed as a summary sheet (Figures 3.3.4.1(a–j)) comprising the following:

- PFA and SER of maturing 1SW and non-maturing 1SW salmon.
- Homewater returns and spawners (90% confidence intervals) and CLs for 1SW and MSW salmon.
- Exploitation rates of 1SW and MSW salmon in homewaters estimated from the returns and catches.
- Total catch (including unreported) of 1SW and MSW salmon.
- National pseudo stock–recruitment relationship (PFA against lagged egg deposition) is also shown and is used to estimate CLs in countries that do not provide one based upon river-specific estimates (Section 3.2). This panel also includes the sum of the river-specific CLs where this is used in the assessment.

Tables 3.3.4.1–3.3.4.6 summarise salmon abundance estimates for individual countries and stock complexes in the NEAC area. The PFA of maturing and non-maturing 1SW salmon and the numbers of 1SW and MSW spawners for the Northern NEAC and Southern NEAC stock complexes are shown in Figure 3.3.4.2.

The model provides an index of the current and historical status of stocks based on fisheries data. The 5th and 95th percentiles shown by the whiskers in each of the plots (Figures 3.3.4.1 and 3.3.4.2) reflect the uncertainty in the input data. It should be noted that the results for the full time-series can change when the assessment is re-run from year to year and as the input data are refined.

The status of stocks is assessed relative to the probability of exceeding CLs, or for PFA, exceeding the SERs. Based on the NEAC run–reconstruction model, the status of the two age groups of the Northern NEAC stock complex, prior to the commencement of distant-water fisheries in the latest available PFA year, were considered to be at full reproductive capacity (Section 1.5; Figure 3.3.4.2). In the Southern NEAC complex, 1SW and MSW stocks were considered to be suffering reduced reproductive capacity prior to the commencement of distant-water fisheries in the latest available PFA year (Figure 3.3.4.2).

The abundances of both maturing 1SW and non-maturing 1SW recruits (PFA) for Northern NEAC (Figure 3.3.4.2) show a general decline over the time period, with the decline more marked in the maturing 1SW stock. Both Northern NEAC stocks have however, been at full reproductive capacity prior to the commencement of distant-water fisheries throughout the time-series. The 1SW spawners in the Northern NEAC stock complex have been at full reproductive capacity throughout the time-series. The MSW spawners, on the other hand, while generally being at full reproductive capacity, have periodically been at risk of suffering reduced reproductive capacity (Figure 3.3.4.2).

The abundance of maturing 1SW recruits (PFA) for Southern NEAC (Figure 3.3.4.2) demonstrates a declining trend over the time period. Both maturing and non-maturing 1SW stock complexes were at full reproductive capacity prior to the commencement of distant-water fisheries in the early part of the time-series. Since the early 1990s, however, the non-maturing 1SW stock has been at risk of suffering reduced reproductive capacity in the majority of the assessment years (Figure 3.3.4.2), and the maturing 1SW stock has been assessed at risk of suffering, or suffering reduced reproductive capacity from 2009 (Figure 3.3.4.2). Both the 1SW and MSW spawning stocks in the Southern NEAC stock complex have been at risk of suffering reduced reproductive capacity or suffering reduced reproductive capacity for the majority of the time-series and are suffering reduced reproductive capacity in the latest assessment (Figure 3.3.4.2).

3.3.4.1 Individual country stocks

The assessment of PFA against SER (Figure 3.3.4.3) and returns and spawners against CL are shown for individual countries (Figures 3.3.4.4 and 3.3.4.5) and by regional blocks (Figures 3.3.4.6 and 3.3.4.7) for the most recent PFA and return years. These assessments show the same broad contrasts between Northern and Southern NEAC stocks as was apparent in the stock complex data.

For all countries in Northern NEAC, the PFAs of both maturing and non-maturing 1SW stocks were at full reproductive capacity prior to the commencement of distant-water fisheries in the most recent PFA year, except for maturing 1SW stocks in the Teno/Tana (Finland and Norway), Iceland and Russia which were at risk of suffering or suffering reduced reproductive capacity (Figure 3.3.4.3). Spawning stocks in Sweden and Norway were at full reproductive capacity in the most recent assessment. However, both maturing and non-maturing spawners in the River Teno/Tana, Iceland and Russia were at risk of suffering or suffering reduced reproductive capacity (Figures 3.3.4.4 and 3.3.4.5).

In Southern NEAC, all maturing 1SW stocks except UK (Northern Ireland) were suffering reduced reproductive capacity both prior to the commencement of distant-water fisheries and at spawning (Figures 3.3.4.3 and 3.3.4.4). In UK (Northern Ireland), the PFA and spawners of maturing 1SW stocks were at full reproductive capacity (Figures 3.3.4.3 and 3.3.4.4). For Southern NEAC non-maturing 1SW stocks, France and UK (England and Wales) were at full reproductive capacity before the commencement of distant-water fisheries (Figures 3.3.4.3 and 3.3.4.4) and at risk of suffering, or suffering reduced reproductive capacity in other countries. Southern NEAC MSW spawning stocks were at full reproductive capacity in UK (England and Wales) only while elsewhere they were at risk of suffering, or suffering reduced reproductive capacity (Figure 3.3.4.5).

Figures 3.3.4.6 and 3.3.4.7 provide more detailed descriptions of the status of returning and spawning stocks by country and region (where assessed) for both Northern and Southern NEAC stocks, again for the most recent return year.

3.3.5 Compliance with river-specific conservation limits

In the NEAC area, nine jurisdictions currently assess salmon stocks using river-specific CLs (Tables 3.3.5.1 and 3.3.5.2 and Figure 3.3.5.1). The attainment of CLs is assessed based on spawners, i.e. after fishery exploitation.

- For the River Teno/Tana (Finland and Norway), the number of major tributary stocks with established CLs rose from nine between 2007 and 2012 (with five annually assessed against CL), to 24 (25 including the main stem) since 2013 (with seven to 15 assessed against their CL). No stocks met their CL prior to 2013. Since then, CL attainment has fluctuated within 20% to 40%. In 2019, including the main stem, five out of 15 (40%) assessable stocks attained their CL.
- CLs were established for 439 Norwegian salmon rivers in 2009, but CL attainment was retrospectively assessed for 165–170 river stocks back to 2005. An average of 181 stocks has been assessed since 2009. An overall increasing trend in CL attainment was evident from 39% in 2009 to 89% in 2017 and 2018 (data are pending for 2019).
- Since 1999, CLs have been established for 85 river stocks in Russia (Murmansk region) with eight of these annually assessed for CL attainment, 88% of which have consistently met their CL during the time-series.
- Sweden established CLs in 2016 for 23 stocks, increasing to 24 stocks since 2017. Eight of the 20 stocks (40%) met CL in 2016. A mean of 27% of assessed stocks have met their CL since then.
- In France, CLs were established for 28 river stocks in 2011, increasing to 35 since 2016. In 2018 and 2019, 9% and 3% of assessed stocks met their CL, respectively. Revised CL attainment information for the period 2011–2017 will be reported next year.
- Ireland established CLs for 141 stocks in 2007, rising to 143 since 2013 to include catchments above hydropower dams. The mean percentage of stocks meeting their CL is 36% over the time-series, with the highest attainment of 41% achieved in 2011 and 2012. This has been followed by a progressive decline thereafter to 28% in 2019.
- UK (England and Wales) established CLs in 1993 for 61 rivers, increasing to 64 from 1995 with an overall mean of 44% meeting their CL. In 2019, only 13% of assessed stocks met their CL, which is the lowest year in the time-series and a decline since 2017.
- Data on UK (Northern Ireland) river-specific CLs are presented from 2002, when CLs were assigned to ten river stocks. Since 2012, 19 stocks have established CLs with up to 18 of these assessed annually for CL attainment. A mean of 41% have met their CL over the presented time-series. A downward trend is evident since 2016 (76%), with 33% of assessed stocks attaining their CL in 2019.
- UK (Scotland) established CLs for 173 assessment groups (rivers and small groups of rivers) with retrospective assessment conducted to 2011. For domestic management, stock status is expressed as the probability of achieving CL and attainment is set at 60%. Mean attainment over the time-series was 52%. In 2018, the most recent reporting year available, 29% of assessment groups met their CL, a decline of 20% on the preceding year.
- Iceland has set provisional CLs for all salmon producing rivers and continues to work towards finalising an assessment process for determining CL attainment. No river-specific CLs have been established for Denmark, Germany, Portugal and Spain.

3.3.6 Marine survival (return rates) for NEAC stocks

There were changes applied to some pre-2019 annual estimates for some rivers, which are explained below:

- France: The method to estimate smolt and spawner runs in French index rivers was revised in 2019. The method is broadly similar (i.e. a hierarchical Bayesian framework that integrates all available data; Servanty and Prévost, 2016), but the revised version was applied retrospectively causing some changes to the complete time-series reported in 2018. Time-series of high return rates in the River Oir must be considered with caution; a large number of spawners might be strays from neighbouring rivers. All estimates are based on wild fish only except for the River Nivelle where juvenile stocking occurred from 1986 to 1995 and likely contributed to adult returns from 1988 to 2000.

- UK (England and Wales): There were corrections applied to some annual estimates for the rivers Tamar, Dee and Frome caused largely by errors in identification of individual fish characteristics, e.g. sea age, or in calculations.

An overview of the trends of marine return rates for wild- and hatchery-reared smolts returning to homewaters (i.e. before homewater exploitation) is presented in Figure 3.3.6.1. The figure shows the proportional change in five-year mean return rates for smolt to 1SW (smolt years 2014–2018, inclusive) and smolt to 2SW (smolt years 2013–2017, inclusive) returns to rivers of Northern and Southern NEAC areas compared to their mean returns for the previous five-year period. It should be noted that: (1) Northern NEAC is represented only by the River Imsa (1SW and 2SW) in Norway, but smolt Passive Integrated Transponder (PIT)-tagging started in three rivers in Norway in 2016 and more rivers are likely to be added in future; (2) the proportional change of return rates for hatchery smolts from Southern NEAC again includes the River Bush from UK (Northern Ireland), together with Ireland and Iceland rivers; (3) there were additional problems counting returns in River Vesturdalsa (Iceland) and 2019 data could not be provided, although a new PIT-tagging programme should make future monitoring less error-prone; and (4) that the scale of change in some rivers is influenced by low return numbers creating high uncertainty, which might have a large consequence on the proportional change.

In Northern NEAC, the recent five-year mean return rate of wild smolts to the River Imsa (Norway) as 1SW returns has increased compared to the previous five years, from 2.74% to 3.02%. In contrast, the mean return rate of wild smolts as 2SW returns has decreased over the same period from 2.22% to 1.50%. The same pattern is seen in hatchery smolts returning to the River Imsa, although more pronounced with hatchery smolts returning as 1SW returns increasing from 2.10% to 2.16% and as 2SW returns decreasing from 1.68% to 0.46%.

The overall trend across rivers in Southern NEAC is for a decreased five-year mean return rate of wild smolts as 1SW returns compared to the previous five years; the exceptions are the rivers Corrib (Ireland) and Tamar (UK (England & Wales)) that saw increased five-year mean return rates, particularly on the River Corrib (increased from 3.00% to 4.71%), and the River Ellidaar (Iceland) that did not change. Five-year mean return rates as 2SW returns were mixed: they decreased in Ireland and UK (Northern Ireland) rivers, but increased in UK (England and Wales) rivers, particularly the River Dee that increased from 0.93% to 1.98%. Five-year mean return rates of all sea age returns to rivers in France generally decreased compared to the previous period, except on the River Scorff in which they increased. The same pattern is seen in hatchery smolts returning as 1SW returns, in which the majority of rivers had decreased five-year return rates; the rivers Burrishoole and Shannon (Ireland) were exceptions that increased, and the River Corrib/Galway did not change.

The annual return rates for different rivers and experimental facilities are presented in Tables 3.3.6.1 and 3.3.6.2. From these data, least squared (or marginal) mean annual return rates were calculated to provide indices of survival for Northern and Southern NEAC 1SW and 2SW returning adult wild and hatchery salmon groups (Figure 3.3.6.2). Values were calculated to balance for variation in the annual number of contributing experimental groups through application of a GLM (Generalised Linear Model) with return rates related to smolt year and river, each as factors, with a quasi-Poisson distribution (log-link function). All annual estimates were used, i.e. there was no restriction on the numbers of years reported and so more rivers could contribute, but only where 1SW and 2SW return rates were reported separately. Note that estimated year effects are presented on a log-scaled y-axis.

Return rates of wild and hatchery smolts to Northern NEAC are variable. They have generally decreased since 1980, although rates of 1SW returns from both wild and hatchery smolts have stabilised since 2010, and for 2SW returns from wild smolts since 1995. Rates of 2SW returns from hatchery smolts to Northern NEAC are highly variable, but have continued to decline in 2019. Mean return rates of wild and hatchery smolts to Southern NEAC are less variable, primarily because they are estimated from more rivers. They too have generally decreased since 1980, although rates of 2SW returns from wild smolts started to increase since 2005, a trend that continued in 2019.

The low return rates in recent years highlighted in these analyses are broadly consistent with the trends in estimated returns and spawners as derived from the PFA model (Section 3.3.4), and that abundance is strongly influenced by factors in the marine environment.

Table 3.1.3.1. Number of gear units licensed or authorised by country and gear type.

Year	UK (England & Wales)					UK (Scotland)		UK (N. Ireland)			Ireland				France		
	Gillnet licences	Sweepnet	Hand-held net	Fixed engine	Rod & Line	Fixed engine (1)	Net and coble (2)	Driftnet	Draftnet	Bagnets and boxes	Driftnets No.	Draftnets	Other nets Commercial	Rod	Rod and line licences in freshwater	Commercial nets in freshwater (5)	Driftnet licences in estuary (6,7)
1971	437	230	294	79	-	3080	800	142	305	18	916	697	213	10 566	-	-	-
1972	308	224	315	76	-	3455	813	130	307	18	1156	678	197	9612	-	-	-
1973	291	230	335	70	-	3256	891	130	303	20	1112	713	224	11 660	-	-	-
1974	280	240	329	69	-	3188	782	129	307	18	1048	681	211	12 845	-	-	-
1975	269	243	341	69	-	2985	773	127	314	20	1046	672	212	13 142	-	-	-
1976	275	247	355	70	-	2862	760	126	287	18	1047	677	225	14 139	-	-	-
1977	273	251	365	71	-	2754	684	126	293	19	997	650	211	11 721	-	-	-
1978	249	244	376	70	-	2587	692	126	284	18	1007	608	209	13 327	-	-	-
1979	241	225	322	68	-	2708	754	126	274	20	924	657	240	12 726	-	-	-
1980	233	238	339	69	-	2901	675	125	258	20	959	601	195	15 864	-	-	-
1981	232	219	336	72	-	2803	655	123	239	19	878	601	195	15 519	-	-	-
1982	232	221	319	72	-	2396	647	123	221	18	830	560	192	15 697	4145	55	82
1983	232	209	333	74	-	2523	668	120	207	17	801	526	190	16 737	3856	49	82
1984	226	223	354	74	-	2460	638	121	192	19	819	515	194	14 878	3911	42	82
1985	223	230	375	69	-	2010	529	122	168	19	827	526	190	15 929	4443	40	82

Year	UK (England & Wales)					UK (Scotland)		UK (N. Ireland)			Ireland				France		
	Gillnet licences	Sweepnet	Hand-held net	Fixed engine	Rod & Line	Fixed engine (1)	Net and coble (2)	Driftnet	Draftnet	Bagnets and boxes	Driftnets No.	Draftnets	Other nets Commercial	Rod	Rod and line licences in freshwater	Commercial nets in freshwater (5)	Driftnet licences in estuary (6,7)
1986	220	221	368	64	-	1955	591	121	148	18	768	507	183	17 977	5919	58 (8)	86
1987	213	206	352	68	-	1679	564	120	119	18	768	507	183	17 977	5724 (9)	87 (9)	80
1988	210	212	284	70	-	1534	385	115	113	18	836	507	183	11 539	4346	101	76
1989	201	199	282	75	-	1233	353	117	108	19	801	507	183	16 484	3789	83	78
1990	200	204	292	69	-	1282	340	114	106	17	756	525	189	15 395	2944	71	76
1991	199	187	264	66	-	1137	295	118	102	18	707	504	182	15 178	2737	78	71
1992	203	158	267	65	-	851	292	121	91	19	691	535	183	20 263	2136	57	71
1993	187	151	259	55	-	903	264	120	73	18	673	457	161	23 875	2104	53	55
1994	177	158	257	53	37 278	749	246	119	68	18	732	494	176	24 988	1672	14	59
1995	163	156	249	47	34 941	729	222	122	68	16	768	512	164	27 056	1878	17	59
1996	151	132	232	42	35 281	643	201	117	66	12	778	523	170	29 759	1798	21	69
1997	139	131	231	35	32 781	680	194	116	63	12	852	531	172	31 873	2953	10	59
1998	130	129	196	35	32 525	542	151	117	70	12	874	513	174	31 565	2352	16	63
1999	120	109	178	30	29 132	406	132	113	52	11	874	499	162	32 493	2225	15	61

Year	UK (England & Wales)					UK (Scotland)		UK (N. Ireland)			Ireland				France		
	Gillnet licences	Sweepnet	Hand-held net	Fixed engine	Rod & Line	Fixed engine (1)	Net and coble (2)	Driftnet	Draftnet	Bagnets and boxes	Driftnets No.	Draftnets	Other nets Commercial	Rod	Rod and line licences in freshwater	Commercial nets in freshwater (5)	Driftnet licences in estuary (6,7)
2000	110	103	158	32	30 139	381	123	109	57	10	871	490	158	33 527	2037	16	51
2001	113	99	143	33	24 350	387	95	107	50	6	881	540	155	32 814	2080	18	63
2002	113	94	147	32	29 407	426	102	106	47	4	833	544	159	35 024	2082	18	65
2003	58	96	160	57	29 936	363	109	105	52	2	877	549	159	31 809	2048	18	60
2004	57	75	157	65	32 766	450	118	90	54	2	831	473	136	30 807	2158	15	62
2005	59	73	148	65	34 040	381	101	93	57	2	877	518	158	28 738	2356	16	59
2006	52	57	147	65	31 606	364	86	107	49	2	875	533	162	27 341	2269	12	57
2007	53	45	157	66	32 181	238	69	20	12	2	0	335	100	19 986	2431	13	59
2008	55	42	130	66	33 900	181	77	20	12	2	0	160	0	20 061	2401	12	56
2009	50	42	118	66	36 461	162	64	20	12	2	0	146	38	18 314	2421	12	37
2010	51	40	118	66	36 159	189	66	2	1	2	0	166	40	17 983	2200	12	33
2011	53	41	117	66	36 991	201	74	2	1	2	0	154	91	19 899	2540	12	29
2012	51	34	115	73	35 135	237	79	1	1	2	0	149	86	19 588	2799	12	25
2013	49	29	111	62	33 301	238	59	0	0	0	0	181	94	19 109	3010	12	25
2014	48	34	109	65	31 605	204	56	0	0	0	0	122	37	18 085	2878	12	20
2015	52	33	102	63	30 847	127	65	0	0	0	0	100	6	18 460	2850	12	20

Year	UK (England & Wales)					UK (Scotland)		UK (N. Ireland)			Ireland				France		
	Gillnet licences	Sweepnet	Hand-held net	Fixed engine	Rod & Line	Fixed engine (1)	Net and coble (2)	Driftnet	Draftnet	Bagnets and boxes	Driftnets No.	Draftnets	Other nets Commercial	Rod	Rod and line licences in freshwater	Commercial nets in freshwater (5)	Driftnet licences in estuary (6,7)
2016	49	34	105	62	30 214	13	43	0	0	0	0	98	4	18 303	3015	19	20
2017	46	32	112	57	35 162	10	41	0	0	0	0	105	5	18 212	4214	20	20
2018	38	30	87	57	31 655	0	26	0	0	0	0	97	8	16 755	3937	19	20
2019 (10)	14	13	60	49	29 126	0	18	0	0	0	0	67	10	17 238	3786	19	20
Mean																	
2014-2018	47	33	103	61	31 897	71	46	0	0	0	0	104	12	17 963	3379	16	20
% change (3)	-70.0	-60.1	-41.7	-19.4	-8.7	-100.0	-61.0	0.0	0.0	0.0	0.0	-35.8	-16.7	-4.0	12.1	15.9	0.0
Mean																	
2009-2018	49	35	109	64	33 753	138	57	3	2	1	0	132	41	18 471	2986	14	25
% change (3)	-71.3	-62.8	-45.2	-23.1	-13.7	-100.0	-68.5	-100.0	-100.0	-100.0	0.0	-49.2	-75.6	-6.7	26.8	33.8	-19.7

Notes:

1 **Number of gear units expressed as trap months.**
2 **Number of gear units expressed as crew months.**
3 **(2018/mean - 1) * 100.**
4 **Dash means "no data."**
5 **Lower Adour only since 1994 (Southwestern France), due to fishery closure in the Loire Basin.**
6 **Adour estuary only (Southwestern France).**
7 **Number of fishermen or boats using driftnets: overestimates the actual number of fishermen targeting salmon by a factor 2 or 3.**
8 **Common licence for salmon and sea trout introduced in 1986, leading to a short-term increase in the number of licences issued.**
9 **Compulsory declaration of salmon catches in freshwater from 1987 onwards.**
10 **Allowable effort in 2019 was zero throughout England and 1025 days were utilised in Wales**

Table 3.1.3.1 Cont'd. Number of gear units licensed or authorised by country and gear type.

Year	Norway				Finland				Russia		
					The Teno River			R. Näätämö	Kola Peninsula	Archangel region	
					Recreational Fishery Tourist anglers		Local rod and net fishery (fishermen)	Recreational fish-ery (fishermen)		Commercial number of gears	
	Bagnet	Bendnet	Liftnet	Driftnet (No. nets)	Fishing days	Fishermen			Catch and release (fishing days)	Coastal	In-river
1971	4608	2421	26	8976	-	-	-	-	-	-	-
1972	4215	2367	24	13 448	-	-	-	-	-	-	-
1973	4047	2996	32	18 616	-	-	-	-	-	-	-
1974	3382	3342	29	14 078	-	-	-	-	-	-	-
1975	3150	3549	25	15 968	-	-	-	-	-	-	-
1976	2569	3890	22	17 794	-	-	-	-	-	-	-
1977	2680	4047	26	30 201	-	-	-	-	-	-	-
1978	1980	3976	12	23 301	-	-	-	-	-	-	-
1979	1835	5001	17	23 989	-	-	-	-	-	-	-
1980	2118	4922	20	25 652	-	-	-	-	-	-	-
1981	2060	5546	19	24 081	16 859	5742	677	467	-	-	-
1982	1843	5217	27	22 520	19 690	7002	693	484	-	-	-
1983	1735	5428	21	21 813	20 363	7053	740	587	-	-	-
1984	1697	5386	35	21 210	21 149	7665	737	677	-	-	-

Year	Norway				Finland				Russia		
					The Teno River			R. Näätämö	Kola Peninsula	Archangel region	
					Recreational Fishery Tourist anglers		Local rod and net fishery (fishermen)	Recreational fishery (fishermen)		Commercial number of gears	
	Bagnet	Bendnet	Liftnet	Driftnet (No. nets)	Fishing days	Fishermen			Catch and release (fishing days)	Coastal	In-river
1985	1726	5848	34	20 329	21 742	7575	740	866	-	-	-
1986	1630	5979	14	17 945	21 482	7404	702	691	-	-	-
1987	1422	6060	13	17 234	22 487	7759	754	689	-	-	-
1988	1322	5702	11	15 532	21 708	7755	741	538	-	-	-
1989	1888	4100	16	0	24 118	8681	742	696	-	-	-
1990	2375	3890	7	0	19 596	7677	728	614	-	-	-
1991	2343	3628	8	0	22 922	8286	734	718	1711	-	-
1992	2268	3342	5	0	26 748	9058	749	875	4088	-	-
1993	2869	2783	-	0	29 461	10 198	755	705	6026	59	199
1994	2630	2825	-	0	26 517	8985	751	671	8619	60	230
1995	2542	2715	-	0	24 951	8141	687	716	5822	55	239
1996	2280	2860	-	0	17 625	5743	672	814	6326	85	330
1997	2002	1075	-	0	16 255	5036	616	588	6355	68	282
1998	1865	1027	-	0	18 700	5759	621	673	6034	66	270

Year	Norway				Finland				Russia		
					The Teno River			R. Näätämö	Kola Peninsula	Archangel region	
					Recreational Fishery Tourist anglers		Local rod and net fishery (fishermen)	Recreational fishery (fishermen)		Commercial number of gears	
	Bagnet	Bendnet	Liftnet	Driftnet (No. nets)	Fishing days	Fishermen			Catch and release (fishing days)	Coastal	In-river
1999	1649	989	-	0	22 935	6857	616	850	7023	66	194
2000	1557	982	-	0	28 385	8275	633	624	7336	60	173
2001	1976	1081	-	0	33 501	9367	863	590	8468	53	121
2002	1666	917	-	0	37 491	10 560	853	660	9624	63	72
2003	1664	766	-	0	34 979	10 032	832	644	11 994	55	84
2004	1546	659	-	0	29 494	8771	801	657	13 300	62	56
2005	1453	661	-	0	27 627	7776	785	705	20 309	93	69
2006	1283	685	-	0	29 516	7749	836	552	13 604	62	72
2007	1302	669	-	0	33 664	8763	780	716		82	53
2008	957	653	-	0	31 143	8111	756	694		66	62
2009	978	631	-	0	29 641	7676	761	656		79	72
2010	760	493	-	0	30 646	7814	756	615		55	66
2011	767	506	-	0	31 269	7915	776	727		78	52
2012	749	448	-	0	32 614	7930	785	681		72	53
2013	786	459	-	0	33 148	8074	785	558		110	71

Year	Norway				Finland				Russia		
					The Teno River			R. Näätämö	Kola Peninsula	Archangel region	
					Recreational Fishery Tourist anglers		Local rod and net fishery (fishermen)	Recreational fishery (fishermen)		Commercial number of gears	
	Bagnet	Bendnet	Liftnet	Driftnet (No. nets)	Fishing days	Fishermen			Catch and release (fishing days)	Coastal	In-river
2014	700	436	-	0	32 852	7791	746	396		57	74
2015	724	406	-	0	33 435	7809	765	232		81	62
2016	798	438	-	0	31 923	7273	712	512		42	59
2017	854	419	-	0	10 074	2468	506	405		29	54
2018	900	411	-	0	10 556	2586	507	512		56	58
2019	936	418	-	0	10 476	2931	481	524		53	25
Mean											
2014-2018	795	422		0	23 768	5585	647	411		53	61
% change (3)	17.7	-0.9		0.0	-55.9	-47.5	-25.7	27.4		0.0	-59.3
Mean											
2009-2018	802	465		0	27 616	6734	710	529		66	62
% change (3)	16.8	-10.0		0.0	-62.1	-56.5	-32.2	-1.0		-19.6	-59.7

Notes:

3 **(2018/mean - 1) * 100.**

4 **Dash means "no data."**

Table 3.1.4.1. Nominal catch of salmon in the NEAC Area (in tonnes round fresh weight), 1960–2019 (2019 figures are provisional).

Year	Southern countries	Northern countries (1)	Faroes (2)	Other catches in international waters	Total reported catch	Unreported catches	
						NEAC Area (3)	International waters (4)
1960	2641	2899	-	-	5540	-	-
1961	2276	2477	-	-	4753	-	-
1962	3894	2815	-	-	6709	-	-
1963	3842	2434	-	-	6276	-	-
1964	4242	2908	-	-	7150	-	-
1965	3693	2763	-	-	6456	-	-
1966	3549	2503	-	-	6052	-	-
1967	4492	3034	-	-	7526	-	-
1968	3623	2523	5	403	6554	-	-
1969	4383	1898	7	893	7181	-	-
1970	4048	1834	12	922	6816	-	-
1971	3736	1846	-	471	6053	-	-
1972	4257	2340	9	486	7092	-	-
1973	4604	2727	28	533	7892	-	-
1974	4352	2675	20	373	7420	-	-
1975	4500	2616	28	475	7619	-	-
1976	2931	2383	40	289	5643	-	-
1977	3025	2184	40	192	5441	-	-
1978	3102	1864	37	138	5141	-	-
1979	2572	2549	119	193	5433	-	-
1980	2640	2794	536	277	6247	-	-
1981	2557	2352	1025	313	6247	-	-
1982	2533	1938	606	437	5514	-	-
1983	3532	2341	678	466	7017	-	-
1984	2308	2461	628	101	5498	-	-
1985	3002	2531	566	-	6099	-	-

Year	Southern countries	Northern countries (1)	Faroes (2)	Other catches in international waters	Total reported catch	Unreported catches	
						NEAC Area (3)	International waters (4)
1986	3595	2588	530	-	6713	-	-
1987	2564	2266	576	-	5406	2554	-
1988	3315	1969	243	-	5527	3087	-
1989	2433	1627	364	-	4424	2103	-
1990	1645	1775	315	-	3735	1779	180-350
1991	1145	1677	95	-	2917	1555	25-100
1992	1524	1806	23	-	3353	1825	25-100
1993	1443	1853	23	-	3319	1471	25-100
1994	1896	1684	6	-	3586	1157	25-100
1995	1775	1503	5	-	3283	942	-
1996	1394	1358	-	-	2752	947	-
1997	1112	962	-	-	2074	732	-
1998	1120	1099	6	-	2225	1108	-
1999	934	1139	0	-	2073	887	-
2000	1210	1518	8	-	2736	1135	-
2001	1242	1634	0	-	2876	1089	-
2002	1135	1360	0	-	2496	946	-
2003	908	1394	0	-	2303	719	-
2004	919	1059	0	-	1978	575	-
2005	809	1189	0	-	1998	605	-
2006	650	1217	0	-	1867	604	-
2007	372	1036	0	-	1407	465	-
2008	355	1178	0	-	1533	433	-
2009	266	898	0	-	1164	317	-
2010	410	1003	0	-	1414	357	-
2011	410	1009	0	-	1419	382	-
2012	295	955	0	-	1250	363	-

Year	Southern countries	Northern countries (1)	Faroes (2)	Other catches in international waters	Total reported catch	Unreported catches	
						NEAC Area (3)	International waters (4)
2013	310	770	0	-	1080	272	-
2014	217	736	0	-	953	256	-
2015	222	859	0	-	1081	298	-
2016	186	842	0	-	1028	298	-
2017	150	870	0	-	1020	318	-
2018	136	824	0	-	960	279	-
2019	77	666	0	-	743	237	-
Mean							
2014–2018	182	826	0	-	1008	290	-
2009–2018	260	877	0	-	1137	314	-

Notes:

1 **All Iceland has been included in Northern countries**

2 **Since 1991, fishing carried out at the Faroes has only been for research purposes.**

3 **No unreported catch estimate available for Russia since 2008.**

4 **Estimates refer to season ending in given year.**

Table 3.1.5.1. Cpue for salmon rod fisheries in Finland (Teno, Näätämö), France, and UK (N. Ireland) (Bush).

Year	Finland (R. Teno)		Finland (R. Näätämö)		France	UK (N. Ireland) (Bush)
	Catch per angler season (kg)	Catch per angler day (kg)	Catch per angler season (kg)	Catch per angler day (kg)	Catch per angler season (number)	Catch per rod day (number)
1974		2.8				
1975		2.7				
1976		-				
1977		1.4				
1978		1.1				
1979		0.9				
1980		1.1				
1981	3.2	1.2				
1982	3.4	1.1				
1983	3.4	1.2				0.248
1984	2.2	0.8	0.5	0.2		0.083
1985	2.7	0.9	n/a	n/a		0.283
1986	2.1	0.7	n/a	n/a		0.274
1987	2.3	0.8	n/a	n/a	0.39	0.194
1988	1.9	0.7	0.5	0.2	0.73	0.165
1989	2.2	0.8	1.0	0.4	0.55	0.135
1990	2.8	1.1	0.7	0.3	0.71	0.247
1991	3.4	1.2	1.3	0.5	0.60	0.396
1992	4.5	1.5	1.4	0.3	0.94	0.258
1993	3.9	1.3	0.4	0.2	0.88	0.341
1994	2.4	0.8	0.6	0.2	2.32	0.205
1995	2.7	0.9	0.5	0.1	1.15	0.206
1996	3.0	1.0	0.7	0.2	1.57	0.267
1997	3.4	1.0	1.1	0.2	0.44 (1)	0.338
1998	3.0	0.9	1.3	0.3	0.67	0.569
1999	3.7	1.1	0.8	0.2	0.76	0.27

Year	Finland (R. Teno)		Finland (R. Näätämö)		France	UK (N. Ireland) (Bush)
	Catch per angler season (kg)	Catch per angler day (kg)	Catch per angler season (kg)	Catch per angler day (kg)	Catch per angler season (number)	Catch per rod day (number)
2000	5.0	1.5	0.9	0.2	1.06	0.26
2001	5.9	1.7	1.2	0.3	0.97	0.44
2002	3.1	0.9	0.7	0.2	0.84	0.18
2003	2.6	0.7	0.8	0.2	0.76	0.24
2004	1.4	0.4	0.9	0.2	1.25	0.25
2005	2.7	0.8	1.3	0.2	0.74	0.32
2006	3.4	1.0	1.9	0.4	0.89	0.46
2007	2.9	0.8	1.0	0.2	0.74	0.60
2008	4.2	1.1	0.9	0.2	0.77	0.46
2009	2.3	0.6	0.7	0.1	0.50	0.14
2010	3.0	0.8	1.3	0.2	0.87	0.23
2011	2.4	0.6	1.0	0.2	0.65	0.12
2012	3.6	0.9	1.7	0.4	0.61	0.15
2013	2.5	0.6	0.7	0.2	0.57	0.27
2014	3.3	0.8	1.4	0.3	0.73	0.15
2015	2.6	0.6	1.7	0.3	0.77	0.07
2016	2.9	0.7	1.1	0.2	0.60	0.05
2017	5.7	1.4	0.8	0.2	0.35	-
2018	2.6	0.6	0.9	0.2	0.25	-
2019	2.7	0.8	1.3	0.3	0.31	-
Mean (2)	3.1	1.0	1.0	0.2	0.8	0.3
2014–2018	3.4	0.8	1.1	0.2	0.6	0.1

Notes:

1 **Large numbers of new, inexperienced anglers in 1997 because cheaper licence types were introduced.**

2 **Mean of the time-series.**

Table 3.1.5.2. Cpue for salmon in coastal and in-river fisheries the Archangelsk region (tonnes/gear) and catch and release rod fishery (fish/rod-day) in rivers of the Russian Kola peninsula.

Year	Archangelsk region commercial fishery		Barents Sea basin			White Sea basin
	Coastal	In-river	Rynda	Kharlovka	Eastern Litsa	Ponoi
1992			2.37	1.45	2.95	4.50
1993	0.34	0.04	1.18	1.46	1.59	3.57
1994	0.35	0.05	0.71	0.85	0.79	3.30
1995	0.22	0.08	0.49	0.78	0.94	3.77
1996	0.19	0.02	0.70	0.85	1.31	3.78
1997	0.23	0.02	1.20	0.71	1.09	6.09
1998	0.24	0.03	1.01	0.55	0.75	4.52
1999	0.22	0.04	0.95	0.77	0.93	3.30
2000	0.28	0.03	1.35	0.77	0.89	3.55
2001	0.21	0.04	1.48	0.92	1.00	4.35
2002	0.21	0.11	2.39	0.99	0.89	7.28
2003	0.16	0.05	1.16	1.14	1.04	8.39
2004	0.25	0.08	1.07	0.98	1.31	5.80
2005	0.17	0.08	1.18	0.82	1.63	4.42
2006	0.19	0.05	0.92	1.46	1.46	6.28
2007	0.14	0.09	0.92	0.78	1.46	5.96
2008	0.12	0.08	1.27	1.14	1.52	5.73
2009	0.09	0.05	1.18	1.29	1.35	5.72
2010	0.21	0.08	1.10	0.99	0.98	4.78
2011	0.15	0.07	0.60	0.90	0.99	4.01
2012	0.17	0.09	1.10	0.87	0.97	5.56
2013	0.12	0.09	0.98	0.85	1.09	4.37
2014	0.22	0.10	1.25	1.42	1.55	5.20
2015	0.16	0.09	1.04	1.33	1.70	3.94
2016	0.31	0.08	1.05	1.28	1.42	3.35
2017	0.36	0.07	1.07	1.88	2.03	3.83

Year	Archangelsk region commercial fishery		Barents Sea basin			White Sea basin
	Coastal	In-river	Rynda	Kharlovka	Eastern Litsa	Ponoi
2018	0.29	0.09	1.07	1.54	1.92	3.62
2019	0.18	na	2.11	1.95	2.38	3.17
Mean (2)	0.21	0.07	1.18	1.10	1.35	4.72
2014–2018	0.27	0.09	1.10	1.49	1.72	3.99

Notes:

2 **Mean of the time-series.**

Table 3.1.5.3. Cpue data for net and fixed engine salmon fisheries by Region in UK (England & Wales). Data expressed as catch per licence-tide, except the North East, for which the data are recorded as catch per licence-day.

Year	Northeast driftnets	Region (aggregated data, various methods)				
		Northeast	Southwest	Midlands	Wales	Northwest
1988		5.49				-
1989		4.39				0.82
1990		5.53				0.63
1991		3.20				0.51
1992		3.83				0.40
1993	8.23	6.43				0.63
1994	9.02	7.53				0.71
1995	11.18	7.84				0.79
1996	4.93	3.74				0.59
1997	6.48	4.40	0.70	0.48	0.07	0.63
1998	5.92	3.81	1.25	0.42	0.08	0.46
1999	8.06	4.88	0.79	0.72	0.02	0.52
2000	13.06	8.11	1.01	0.66	0.18	1.05
2001	10.34	6.83	0.71	0.79	0.16	0.71
2002	8.55	5.59	1.03	1.39	0.23	0.90
2003	7.13	4.82	1.24	1.13	0.11	0.62
2004	8.17	5.88	1.17	0.46	0.11	0.69
2005	7.23	4.13	0.60	0.97	0.09	1.28
2006	5.60	3.20	0.66	0.97	0.09	0.82
2007	7.24	4.17	0.33	1.26	0.05	0.75
2008	5.41	3.59	0.63	1.33	0.06	0.34
2009	4.76	3.08	0.53	1.67	0.04	0.51
2010	17.03	8.56	0.99	0.26	0.09	0.47
2011	19.25	9.93	0.63	0.14	0.10	0.34
2012	6.80	5.35	0.69		0.21	0.31
2013	11.06	8.22	0.54		0.08	0.39
2014	10.30	6.12	0.43		0.07	0.31

Year	Northeast driftnets	Region (aggregated data, various methods)				
		Northeast	Southwest	Midlands	Wales	Northwest
2015	12.93	7.22	0.64		0.08	0.39
2016	10.95	9.98	0.78		0.10	0.38
2017	7.58	5.64	0.58		0.15	0.26
2018	6.27	6.05	1.07		0.15	0.92
2019					0.15	
Mean (2)	8.98	5.73	0.77	0.84	0.11	0.60
2014–2018	9.61	7.00	0.70		0.11	0.45

Notes:

2 **Mean of the time-series.**

Table 3.1.5.4. Catch per unit of effort (cpue) for salmon rod fisheries in each Region in UK (England & Wales), 1997–2019. [Cpue is expressed as number of salmon (including released fish) caught per 100 days fished.

Year	Region						NRW Wales	England & Wales
	NE	Thames	Southern	SW	Midlands	Wales		
1997	5.0	0.6	3.1	5.2	1.7	2.6	2.6	4.0
1998	6.5	0.0	5.9	7.5	1.3	3.9	3.9	6.0
1999	7.4	0.3	3.1	6.3	2.1	3.5	3.5	5.5
2000	9.2	0.0	5.2	8.8	4.9	4.4	4.4	7.9
2001	11.3	0.0	11.0	6.6	5.4	5.5	5.5	8.7
2002	9.4	0.0	18.3	6.0	3.5	3.6	3.6	6.8
2003	9.7	0.0	8.8	4.7	5.2	2.9	2.9	5.7
2004	14.7	0.0	18.8	9.6	5.5	6.6	6.6	11.4
2005	12.4	0.0	12.7	6.2	6.6	4.5	4.5	9.0
2006	14.2	0.0	15.6	8.7	6.6	5.9	5.9	10.1
2007	11.7	0.0	18.0	8.7	5.7	6.0	6.0	9.6
2008	12.7	0.0	21.8	10.9	5.8	7.3	7.3	10.5
2009	9.5	0.0	13.7	5.7	3.6	3.6	3.6	6.6
2010	16.7	2.8	17.1	9.9	4.3	6.5	6.5	10.2
2011	17.5	0.0	14.5	9.4	6.5	6.0	6.0	10.9
2012	15.4	0.0	17.3	9.2	6.3	6.5	6.5	10.6
2013	16.7	0.0	10.0	5.9	7.9	5.7	5.7	8.9
2014	12.1	0.0	11.9	4.8	5.0	6.9	4.4	7.1
2015	8.7	0.0	16.6	8.8	9.0	7.0	4.8	7.1
2016	13.5	0.0	16.8	7.8	9.5	8.5	6.4	9.1
2017	13.5	0.0	13.6	8.7	8.0	9.3	6.6	9.4
2018	10.5	0.0	5.0	4.9	6.7	9.0	4.0	7.2
2019	11.9	0.0	6.6	4.2	5.5	7.6	3.4	7.0
Mean (2)	11.7	0.2	12.4	7.3	5.5	5.8	5.0	8.2
2014–2018	11.7	0.0	12.8	7.0	7.6	8.1	5.2	8.0

Notes:

2 **Mean of the time-series.**

Table 3.1.5.5. Cpue data for UK (Scotland) net fisheries. Catch in numbers of fish per unit of effort.

Year	Fixed engine cpue Catch/trap month [1]	Net and coble cpue Catch/crew month
1952	33.9	156.4
1953	33.1	121.7
1954	29.3	162.0
1955	37.1	201.8
1956	25.7	117.5
1957	32.6	178.7
1958	48.4	170.4
1959	33.3	159.3
1960	30.7	177.8
1961	31.0	155.2
1962	43.9	242.0
1963	44.2	182.9
1964	57.9	247.1
1965	43.7	188.6
1966	44.9	210.6
1967	72.6	329.8
1968	47.0	198.5
1969	65.5	327.6
1970	50.3	241.9
1971	57.2	231.6
1972	57.5	248.0
1973	73.7	240.6
1974	63.4	257.1
1975	53.6	235.7
1976	42.9	150.8
1977	45.6	188.7
1978	53.9	196.1
1979	42.2	157.2

Year	Fixed engine cpue Catch/trap month (1)	Net and coble cpue Catch/crew month
1980	37.6	158.6
1981	49.6	183.9
1982	61.3	180.2
1983	55.8	203.6
1984	58.9	155.3
1985	49.6	148.9
1986	75.2	193.4
1987	61.8	145.6
1988	50.6	198.4
1989	71.0	262.4
1990	33.2	146.0
1991	35.9	106.4
1992	59.6	153.7
1993	52.8	125.2
1994	92.1	123.7
1995	75.6	142.3
1996	57.5	110.9
1997	33.0	57.8
1998	36.0	68.7
1999	21.9	58.8
2000	54.4	105.5
2001	61.0	77.4
2002	35.9	67.0
2003	68.3	66.8
2004	42.9	54.5
2005	45.8	80.9
2006	45.8	73.3
2007	47.6	91.5

Year	Fixed engine cpue Catch/trap month [1]	Net and coble cpue Catch/crew month
2008	56.1	52.5
2009	42.2	73.3
2010	77.0	179.3
2011	62.6	80.7
2012	50.2	46.7
2013	64.6	129.4
2014	60.6	79.2
2015	74.8	50.2
2016	0*	65.4
2017	0*	52.4
2018	0*	147.1
2019	0*	25.8
Mean [2]	50.8	150.0
2014–2018	67.7	78.9

Notes:

1 **Excludes catch and effort for Solway Region.**

2 **Mean of the time-series.**

***** **No information on effort for fixed engine presented due to fishery regulation.**

Table 3.1.5.6. Cpue (number of salmon in three size groups caught per gear day) in marine fisheries in Norway.

Year	Bagnet			Bendnet		
	< 3kg	3-7 kg	>7 kg	< 3kg	3-7 kg	>7 kg
1998	0.88	0.66	0.12	0.80	0.56	0.13
1999	1.16	0.72	0.16	0.75	0.67	0.17
2000	2.01	0.90	0.17	1.24	0.87	0.17
2001	1.52	1.03	0.22	1.03	1.39	0.36
2002	0.91	1.03	0.26	0.74	0.87	0.32
2003	1.57	0.90	0.26	0.84	0.69	0.28
2004	0.89	0.97	0.25	0.59	0.60	0.17
2005	1.17	0.81	0.27	0.72	0.73	0.33
2006	1.02	1.33	0.27	0.72	0.86	0.29
2007	0.43	0.90	0.32	0.57	0.95	0.33
2008	1.07	1.13	0.43	0.57	0.97	0.57
2009	0.73	0.92	0.31	0.44	0.78	0.32
2010	1.46	1.13	0.39	0.82	1.00	0.38
2011	1.30	1.98	0.35	0.71	1.02	0.36
2012	1.12	1.26	0.43	0.89	1.03	0.41
2013	0.69	1.09	0.25	0.38	1.30	0.29
2014	1.83	1.08	0.24	1.27	1.08	0.29
2015	1.32	1.61	0.30	0.41	1.16	0.22
2016	0.84	1.40	0.35	0.55	1.83	0.42
2017	1.65	1.35	0.30	1.02	1.49	0.45
2018	2.05	1.56	0.30	1.08	1.51	0.41
2019	0.97	1.59	0.26	0.72	1.02	0.28
Mean (2)	1.21	1.15	0.28	0.77	1.02	0.32
2014–2018	1.54	1.40	0.30	0.87	1.41	0.36

Notes:

2 **Mean of the time-series.**

Table 3.1.6.1. Percentage of 1SW salmon in catches from countries in the Northeast Atlantic, 1987–2019.

Year	Iceland	Fin-land	Norway	Russia	Sweden	Northern countries	UK (Scot)	UK (E&W)	France	Spain(1)	Southern countries
1987		66	61	71		63	61	68	77		63
1988		63	64	53		62	57	69	29		60
1989	69	66	73	73	41	72	63	65	33		63
1990	66	64	68	73	75	69	48	52	45	71	49
1991	71	59	65	70	74	66	53	71	39	37	58
1992	72	70	62	72	69	65	55	77	48	45	59
1993	76	58	61	61	67	63	57	81	74	33	64
1994	63	55	68	69	67	67	54	77	55	61	61
1995	71	59	58	70	85	62	53	72	60	22	59
1996	73	79	53	80	68	61	53	65	51	22	57
1997	73	69	64	82	57	68	54	73	51	21	60
1998	82	75	66	82	66	70	58	82	71	49	65
1999	70	80	65	78	81	68	45	68	27	13	54
2000	82	69	67	75	69	68	54	79	58	63	65
2001	78	52	58	74	54	60	55	75	51	36	63
2002	83	40	49	70	62	54	54	76	69	33	64
2003	75	50	61	67	79	62	52	66	51	14	56
2004	86	50	52	68	50	58	51	81	40	59	59
2005	87	74	67	66	59	69	58	76	41	15	62
2006	84	73	54	77	61	60	57	78	50	16	62
2007	91	35	42	69	34	50	57	78	45	25	62
2008	90	37	46	58	36	54	48	76	42	11	55
2009	91	72	49	63	40	59	49	72	42	30	54
2010	82	56	56	58	49	61	55	78	67	33	63
2011	85	68	41	58	32	50	36	57	35	2	45
2012	86	75	47	70	30	55	49	50	38	18	49
2013	90	65	52	65	38	62	55	58	47	13	56
2014	80	70	59	63	46	61	49	54	40	4	50

2015	91	60	51	65	29	59	60	47	34	4	52
2016	81	53	43	66	35	48	50	42	51	30	45
2017	84	41	48	46	27	51	46	40	61	29	45
2018	87	77	52	55	46	60	60	45	40	21	50
2019	86	45	49	56	22	52	56	44	32	9.9	44
Mean											
1987–2000	72	67	64	72	68	66	55	71	51	40	60
2001–2019	85	57	51	64	44	57	52	63	46	22	55

Notes:

1 **Asturias Region only for 1987 to 2018 all regions of Spain in 2019.**

Table 3.2.1.1. Conservation limit options for NEAC stock groups estimated from river-specific values, where available, or the national PFA run–reconstruction model. Spawner Escapement Reserve (SERs) based on the CLs used are also shown. All values are given in numbers of fish.

Country and Complex	National Model CLs		River Specific CLs		Conservation Limit used		Spawner Escapement Reserve (SER)	
	1SW	MSW	1SW	MSW	1SW	MSW	1SW	MSW
Finland			14 123	9570	14 123	9570	17 185	16 478
Iceland (north and east)	5087	1827			5087	1827	6284	3146
Norway			53 792	73 860	53 792	73 860	68 485	123 385
Russia	58 344	31 775			58 344	31 775	74 437	57 291
Sweden			1898	2654	1898	2654	2453	4639
Northern NEAC Stock Complex					133 245	119 687	168 843	204 939
France			17 400	5100	17 400	5100	22 489	9469
Iceland (south and west)	17 004	1489			17 004	1489	21 004	2563
Ireland			211 471	46 943	211 471	46 943	269 229	78 419
UK (England & Wales)			53 988	29 918	53 988	29 918	68 734	51 510
UK (N. Ireland)			19 339	3556	19 339	3556	23 707	5995
UK (Scotland)	274 533	208 775			274 533	208 775	349 515	354 396
Southern NEAC Stock Complex					593 735	295 781	754 678	502 353

Table 3.3.4.1. Estimated number of returning 1SW salmon by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	24386	9427		154506	17187				50074	62554	1054472	82307	181752	610321	1823515	2059487	2344022			
1972	95150	8613		117293	13623				99286	50591	1125517	79021	158618	613422	1887189	2150044	2481588			
1973	44088	10319		172877	16956				60851	54190	1221374	94108	138958	751722	2056766	2342852	2701524			
1974	61366	10291		172787	24457				28468	38571	1391842	117316	151987	726238	2168939	2475674	2876184			
1975	72653	12537		264637	26659				56738	59920	1544522	119451	124616	609062	2208143	2535019	2958386			
1976	66338	12635		184085	14934				52040	47275	1047707	80667	86487	463086	1564990	1793666	2084220			
1977	37458	17560		117302	6768				40174	48763	907373	91339	85273	588325	1557444	1777485	2050857			
1978	35758	17799		118698	8048				41044	63445	791927	104391	111015	617370	1545949	1747487	2007232			
1979	32115	17088		164569	8262				46890	58669	728590	99676	77976	620909	1452600	1652125	1907596			
1980	25530	2590		116979	10620				98289	26788	552716	93604	98792	412059	1152659	1299057	1485371			
1981	22910	13353		96882	19409				77817	34448	291062	97801	77319	530188	1001692	1121220	1297194			
1982	13660	6131		85177	17079				48190	35342	603142	83539	111795	599257	1341728	1495876	1690865			
1983	33402	9031	698197	141922	22799	814394	907801	1020647	51077	44725	1065319	121935	156927	693070	1924621	2151096	2424246	2814310	3065363	3359087
1984	36389	3281	730405	152782	32142	856794	957956	1075639	84600	27421	558306	106404	61681	643679	1340197	1498505	1704749	2265513	2460402	2695473
1985	48003	22607	742990	210046	38121	961506	1066924	1180916	31519	44644	927017	106821	79959	584488	1592259	1788941	2041383	2632601	2859606	3133982

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total 5%	50%	95%	France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total 5%	50%	95%	Total 5%	50%	95%
1986	37919	28205	646881	179293	39837	848186	934960	1035800	48643	72956	1037803	123498	90050	678222	1846345	2080855	2369215	2765278	3019001	3323929
1987	46048	16621	543781	190899	31733	758345	832300	916326	85428	45414	669304	128430	49189	567300	1381949	1579390	1840895	2199942	2414279	2687535
1988	26991	24060	498001	131863	26677	646660	708978	780746	29267	81643	907979	176108	115738	694428	1791733	2032939	2345516	2495493	2743923	3066252
1989	58836	12939	548678	196959	7777	751861	827076	920785	16052	45564	651102	119092	111024	763247	1506979	1727103	2051903	2320649	2555967	2894847
1990	58935	9699	492441	163169	17998	676999	744544	823504	27027	41797	407017	84805	92217	502487	1027382	1172568	1404492	1756796	1921130	2162782
1991	57856	14079	429647	138434	22577	604416	665449	736904	19510	46423	291471	83943	51506	427279	811952	933010	1128330	1462274	1601643	1809067
1992	81622	26506	362366	171143	25130	613507	670871	734170	35365	53066	421710	88037	104286	544363	1105195	1267923	1527872	1766600	1941686	2205966
1993	55083	21866	362631	147034	24878	564141	615264	671051	50493	51852	343777	122493	121854	600469	1145779	1314686	1615699	1754447	1931170	2235451
1994	30729	6979	492346	173014	19369	655735	726436	809077	39962	42949	439649	136021	83838	611005	1203695	1375627	1660218	1913523	2105993	2401023
1995	30500	18297	320980	156376	28108	511080	558111	610075	13451	53058	491039	103523	77894	596892	1184438	1348901	1638151	1735776	1908477	2198986
1996	46985	9791	244514	212379	16735	488248	533554	584264	16456	45655	456623	76950	80542	447948	987915	1138512	1399747	1516661	1674680	1938273
1997	42812	13349	282516	208560	7660	509383	557846	612139	8574	33374	457778	68995	95524	388840	929868	1066229	1283350	1478425	1626308	1849200
1998	53528	22826	368183	227534	6162	621133	683205	750038	16492	45632	478927	75535	207104	432390	1121425	1273949	1521594	1791239	1959588	2216036
1999	78772	11583	341914	176668	9685	567846	621909	680635	5528	37179	446079	60164	54184	296378	795896	911836	1083063	1405394	1535795	1718592
2000	85358	12135	564244	193407	17707	798215	877067	966256	14429	32983	619185	91935	79488	461535	1148824	1318174	1581309	2007363	2198773	2472720
2001	62084	11039	486291	260664	11010	747973	838967	946080	12282	29437	492421	79495	63278	479187	1022330	1170194	1441391	1834994	2016168	2303847

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	38387	19029	298039	237090	10656	539629	607736	699242	28202	36744	429671	75084	112455	360183	942922	1059254	1249058	1530315	1675174	1882684
2003	37766	10146	412714	211621	5761	608163	683385	773102	18381	44040	422653	57859	70440	342810	850372	972413	1185161	1511464	1660528	1885826
2004	16069	27421	249877	147796	4855	403414	449247	506718	22320	44085	310444	104812	67342	470850	896300	1036979	1303398	1339807	1491021	1760032
2005	35390	24492	370533	169311	4742	547563	608505	682629	14451	65060	310476	85093	84754	472029	906174	1047170	1337973	1499442	1660373	1960213
2006	57958	25624	299783	204333	5261	533865	597213	674555	20240	45957	237042	83397	57276	421541	755305	883263	1145135	1335352	1485200	1750270
2007	16958	19086	167912	110063	1639	284648	317673	358844	15855	52683	241804	79716	85026	435449	774970	951051	1235115	1089828	1269942	1555102
2008	18200	17371	210234	114671	2545	327505	365816	411626	15558	63723	254237	78806	53268	352836	695645	854856	1123167	1056821	1224215	1496533
2009	32309	28068	168278	108898	2717	308432	342334	381508	4527	71814	206899	49694	33306	272927	543323	665557	865924	880754	1010596	1212991
2010	26015	22390	249909	123619	4603	386759	429342	477785	15089	73595	271872	98478	33079	494745	835063	1030069	1358421	1259805	1462096	1791153
2011	29442	18603	175903	132045	5047	326819	363208	405829	10395	51772	236021	66214	23870	280627	570864	698724	915304	927546	1063936	1283216
2012	51060	9638	195781	152679	5576	376316	418254	472393	11314	29444	242775	38158	54677	347950	609543	758643	1010676	1021691	1180406	1438873
2013	29451	22967	184086	118026	3250	323662	361801	408755	15708	87873	205445	53124	60696	277185	608617	734541	932186	964156	1099782	1301555
2014	41843	10819	251559	111962	9606	381902	430853	487752	13881	21604	125606	30993	27678	162433	330984	400533	511525	745768	835460	957759
2015	26052	30541	221466	115796	3057	359306	401184	453281	12977	60176	178491	38990	29541	253529	490866	600456	785908	883579	1004644	1194436
2016	20288	12969	171960	82728	1660	263208	292431	327266	11642	35410	179860	41286	55599	246334	486729	599091	795182	774643	893892	1090844
2017	12981	12649	226839	29991	4445	258420	288610	325725	14781	36995	196810	29676	46896	212625	454979	564066	752654	740403	856006	1044155

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	32865	13447	232336	99729	7286	349190	390328	439371	12410	31833	141564	36034	40797	201632	398041	488487	642878	778327	882618	1040868
2019	10722	7077	181179	72089	4201	248802	278371	312965	12647	19074	121101	25727	31277	240146	374286	469541	649827	648071	748828	931327
Mean																				
10-year	28072	16110	209102	103867	4873	327438	365438	411112	13084	44778	189954	45868	40411	271721	515997	634415	835456	874399	1002767	1207419

Table 3.3.4.2. Estimated number of returning MSW salmon by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	22822	9641		132616	641				10858	24482	157352	90417	21908	362612	594502	676620	794668			
1972	23782	15108		134742	507				21618	37497	168912	149837	19141	469657	767994	877677	1031192			
1973	38292	14131		223033	2252				13200	33796	181861	114887	16742	467050	733421	837321	984524			
1974	65327	13376		209796	1421				6142	29230	205834	84734	18286	333770	601669	687187	801580			
1975	83251	14787		225528	402				12258	30991	231584	115936	15036	441463	741069	858748	1039095			
1976	64820	12170		195104	1210				8993	26808	161147	60498	10450	237280	439077	513341	624948			
1977	45499	16940		134280	519				6923	26126	139815	76754	10297	346768	525881	615163	765922			
1978	23106	21905		115981	638				7112	33801	120755	64878	13403	458646	585699	704507	951282			
1979	23025	14439		101543	1663				8091	21666	108456	31628	9411	358774	444891	543109	747155			
1980	22536	20135		169276	3245				17112	30424	120018	103303	11908	479094	651111	769679	987193			
1981	26751	7025		96774	717				11569	20303	88764	147072	9347	455287	641618	741183	893639			
1982	35433	8074		85253	3484				7144	14332	51329	56295	13528	293776	377140	439926	548695			
1983	39252	6150	427854	123921	2270	544795	601812	668615	7718	23964	105895	64102	18939	319755	476509	545756	660272	1056286	1150458	1278545
1984	32895	7931	438496	123713	3188	552593	608255	673478	12755	20303	76383	51548	7438	277105	385675	449515	568393	973158	1062324	1188978
1985	31874	5125	405279	135380	1183	527424	581199	640916	9520	14698	83769	75923	9656	290209	420129	488471	616262	981906	1073624	1208976

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total 5%	50%	95%	France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total 5%	50%	95%	Total 5%	50%	95%
1986	26049	13930	485673	133838	606	597611	662682	735671	9736	12302	94785	103102	10858	362554	513567	599845	740593	1154977	1265709	1420116
1987	34458	14471	366865	99341	2719	472247	520400	575586	5143	10887	117177	83021	5537	245391	402956	472437	591310	908997	996452	1123290
1988	24343	9309	307153	99681	2925	406272	444897	488185	14166	12430	85059	107804	15598	250352	421101	493111	619993	854568	939948	1072043
1989	23865	7893	219168	97172	10215	330637	359338	393823	6495	11076	77494	86735	12463	247571	379562	448051	569140	732387	809778	934381
1990	26271	8310	260027	124714	5317	391549	426225	467010	6634	10995	37114	106297	11307	270684	377805	448655	585948	794380	877422	1018557
1991	35148	5776	219834	122298	7145	361217	391480	427004	6069	10951	56002	46774	5818	195789	270009	324447	448191	652471	718734	844978
1992	33958	8611	239161	116326	9936	377260	409394	446613	7643	12361	42955	35901	13329	184720	248648	299348	403808	647481	711241	821608
1993	35638	9727	229817	137738	11211	395731	425644	458858	3552	6046	41949	39427	31371	192334	263294	321089	443784	681987	748713	874055
1994	33723	8234	224655	121627	8595	368583	399204	433439	7609	9844	67527	55384	11036	234214	323938	389664	527572	716410	790129	929683
1995	22077	5213	240553	138506	4257	381367	412094	447719	3642	10072	65314	55483	9349	272017	344138	420111	593459	750778	834334	1009732
1996	20388	6842	241461	104452	6951	351752	381892	414009	6510	6528	43687	57556	10217	219518	279487	349150	508928	654255	733001	889675
1997	24625	3850	159505	85141	5041	258168	279575	303644	3317	7301	56371	35706	12706	162046	228409	285076	405412	504083	566672	686105
1998	23589	5617	191294	105524	2777	305426	330137	358229	2833	4511	32844	23142	17470	132119	175406	215888	313087	497895	548212	646902
1999	28027	6469	204828	92928	1989	305896	335553	368140	6079	8828	51379	47165	7970	154634	226195	289982	405201	555979	626998	744627
2000	53528	3786	283214	162382	7058	472696	512090	555125	4265	2396	64000	48468	9735	157245	240193	293026	399935	737522	808619	920028
2001	64572	4351	333363	114635	8441	483207	527590	576945	4969	4218	56956	51798	6629	207553	268948	339685	500283	783592	869526	1033321

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	56627	4097	288545	124851	5736	442139	482320	528503	4586	4559	65634	46443	8312	146598	230956	284757	393221	699170	769944	884837
2003	40738	4309	255877	87258	1380	359105	391079	427676	6645	7277	68997	60113	5088	168118	261765	326581	455464	645928	718967	849836
2004	18526	4248	231799	67259	4243	298245	326780	360063	12505	5881	38065	51254	5348	227485	272047	348417	527930	592098	677270	858786
2005	15380	5244	212921	80609	2865	292163	317973	347800	7652	5205	49293	56078	6725	221103	279015	354195	522732	592571	674608	843249
2006	22567	5041	270535	77252	2979	347614	379222	414035	7684	4305	36049	50450	5306	271857	294308	385121	596039	667765	766292	978707
2007	32774	4870	229942	80596	2775	325590	352131	381415	7256	2655	25129	48492	5503	223022	245784	320268	482062	592900	673534	839186
2008	32975	6231	265168	125789	3916	398718	436429	479672	8013	3030	18695	53128	4296	296973	296229	392102	616543	724759	831196	1057357
2009	14192	5017	207783	107166	3444	308735	338870	374915	3732	4683	23574	41136	4336	245867	254301	329646	508582	587892	670046	851443
2010	22688	7109	228820	132621	4033	362284	397096	437277	3065	9701	21987	60445	6337	323757	332876	433894	668579	723845	832995	1067195
2011	17572	7972	319000	131907	9407	441729	487979	540867	8606	4940	23749	102583	8093	414253	440843	575735	854765	919801	1066858	1346408
2012	21118	4509	279333	64909	10753	345777	382113	425971	6837	2794	21067	79934	19090	320588	355017	463493	708862	731408	847454	1094301
2013	20386	5129	197243	74430	4564	275094	302975	334953	7076	7780	23886	77548	6086	296583	329286	430455	656050	629540	735568	956746
2014	22137	6178	202721	73544	9776	283747	315513	352305	8732	4762	20055	52683	3290	200739	232830	298346	436818	539481	616408	757013
2015	21285	5887	256094	69174	6667	323262	360267	403469	9882	4319	20826	85253	4228	243530	293575	382297	561914	644911	744729	928163
2016	22784	8244	280946	58991	2616	337127	374336	417612	4206	6174	20535	111763	7814	265851	328235	432133	651356	695259	809773	1031887
2017	16431	4685	284920	54577	11003	333932	373273	418005	4799	5256	18926	87959	6323	234460	281431	371319	564612	644550	747102	941829

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	10131	5096	267956	72010	7298	325475	364146	408867	7240	5630	19274	85104	5970	134503	208311	269586	383538	560230	636265	755910
2019	14501	3356	226486	57508	14747	285593	318826	356572	10152	2619	14790	70533	4492	171720	209143	278106	426542	520968	599836	749947
Mean																				
10-year	18903	5816	254352	78967	8086	331402	367653	409590	7060	5397	20509	81381	7172	260598	301155	393536	591304	660999	763699	962940

Table 3.3.4.3. Estimated pre-fishery abundance of maturing 1SW salmon (potential 1SW returns) by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	29799	11710			22142				65109	77427	1346109	105662	222745	779079	2263523	2618121	3041925			
1972	115615	10722		150717	17620				128285	62661	1436013	101567	194560	784420	2351969	2736059	3217416			
1973	53779	12831		222521	21856				79072	67110	1558831	120461	170568	960354	2558079	2982993	3512767			
1974	74655	12755		220898	31493				36909	47641	1772385	149418	185862	927516	2695026	3141899	3720778			
1975	88694	15586		339733	34382				73579	74282	1966513	153166	153041	778847	2754468	3224520	3834131			
1976	80718	15685		236793	19273				67378	58519	1338560	103410	106319	591607	1950392	2284554	2702887			
1977	45694	21691		150625	8765				51909	60401	1156429	116662	104638	750361	1940097	2260973	2661327			
1978	43527	22010		152622	10367				53005	78576	1009600	133156	135882	786410	1917722	2222543	2596003			
1979	39073	21102		211375	10648				60813	72607	928979	127316	95592	791971	1807405	2102411	2467818			
1980	31182	3324		150683	13705				127263	33313	707956	120422	121889	530697	1443890	1664234	1935870			
1981	28099	16705		125517	25023				101197	43117	381118	126982	96677	685647	1268653	1452495	1700979			
1982	16896	7767		109983	22044				62734	44124	774854	108683	138221	772841	1680312	1920880	2212927			
1983	40858	11387	889701	183206	29416	1011815	1159107	1330206	66589	55737	1365668	157985	193871	893333	2405374	2754407	3165297	3496079	3918880	4410005
1984	44253	4135	928497	195818	41397	1062739	1217480	1399730	109647	34005	713411	136523	76053	825026	1668660	1915074	2224747	2801960	3139812	3532995
1985	58359	27974	944984	269736	49133	1190706	1356072	1540243	40899	55290	1181419	136523	98081	744656	1974399	2276293	2657979	3245156	3641682	4107976

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1986	46231	34992	825043	230624	51423	1052395	1193438	1354423	63274	90441	1326234	158976	111155	868956	2300633	2655212	3094558	3423964	3852744	4361577
1987	55928	20660	691292	245293	40946	939197	1060015	1199376	110644	56294	853503	164795	61021	728129	1729351	2017803	2392793	2730540	3082462	3511957
1988	32888	29757	634125	169501	34423	800476	902473	1020457	37818	100993	1156154	225050	142215	888097	2230753	2585515	3042949	3088626	3490978	3999209
1989	71594	16039	698679	251692	10012	927711	1050671	1200038	20899	56487	831373	152088	136205	975356	1876890	2195484	2650763	2870603	3253087	3758509
1990	71708	12023	628592	208386	23287	835999	946541	1071935	35198	51784	520195	108444	112932	642838	1280584	1493525	1820469	2169461	2446420	2813145
1991	70330	17407	546713	177715	29234	745970	844606	958454	25241	57353	371571	107182	63114	545906	1012078	1186809	1451521	1805915	2038922	2343966
1992	99252	32812	460466	218949	32440	755758	848395	957832	45903	65557	536684	112208	127322	694392	1373474	1608972	1974846	2176153	2464867	2858048
1993	66835	27058	460854	188137	32169	694175	779602	875042	65172	64162	437088	155657	148877	766083	1425180	1669127	2069964	2167971	2452649	2881132
1994	37293	8624	626494	222301	25025	811146	923811	1053539	51834	53002	558977	172961	102327	778815	1493312	1748119	2138359	2366825	2682030	3108337
1995	37027	22556	408421	200208	36488	631209	708891	797956	17472	65470	625228	132044	95171	761498	1465619	1716184	2104024	2141650	2431111	2844311
1996	57094	12089	310800	271990	21660	602678	677348	765193	21261	56553	581251	97852	98501	570100	1228837	1446127	1798143	1872801	2127318	2502399
1997	52047	16498	359453	267408	9881	628663	708174	800262	11011	41228	581751	87971	116475	495137	1155807	1349378	1653811	1823578	2061536	2392784
1998	65067	28141	467855	293356	7949	767879	867290	978433	21271	56404	608031	95813	252998	552175	1386846	1610186	1955346	2203078	2482883	2859213
1999	95813	14295	433974	225551	12543	700430	786928	886621	7146	45839	566880	76436	66086	377231	985940	1157211	1397479	1728437	1948492	2230053
2000	103652	14973	718190	248053	22903	985760	1112333	1260045	18608	40678	786225	116798	97093	587521	1422706	1674221	2047137	2471975	2793436	3214915
2001	75319	13637	617835	334429	14232	927627	1065107	1229615	15805	36399	626363	101283	77274	608455	1267927	1487460	1848730	2259503	2562319	2970011

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	46670	23495	378463	304561	13748	668424	773138	909491	36426	45356	546913	95361	137058	458481	1164988	1342480	1609902	1886938	2122519	2443554
2003	45859	12531	525479	271114	7452	753364	867572	1007342	23831	54463	538891	73937	85941	437410	1056245	1234890	1522804	1864956	2112023	2437465
2004	19502	33809	317747	189638	6263	498003	571524	658407	28738	54362	395072	132989	82406	598437	1113466	1317397	1667864	1656197	1894810	2266903
2005	42922	30174	470486	216733	6127	678474	772873	887651	18696	80403	394767	108217	103261	599576	1123426	1326907	1713097	1851618	2107441	2527375
2006	70382	31717	381157	261223	6790	657972	756906	874072	26159	56656	301452	105997	69961	536583	938424	1121450	1462311	1649563	1886462	2246468
2007	20618	23582	213223	140932	2118	351367	403158	465674	20577	64991	308566	101391	103778	554492	961298	1204007	1581436	1347090	1611152	2003731
2008	22150	21502	267351	146155	3279	406064	464585	535533	20180	78767	323636	100177	65187	449175	864938	1086486	1440952	1314114	1556776	1924206
2009	39241	34660	214119	137504	3503	379312	431659	491832	5847	88733	262557	63014	40577	347039	678298	843406	1109388	1090530	1277936	1560645
2010	31605	27626	317867	156449	5942	477101	542645	618924	19521	91060	346164	125109	40428	630253	1043926	1306783	1737797	1564200	1853625	2301677
2011	35883	22992	223554	167392	6511	402719	459545	525558	13515	63940	300949	84378	29266	358022	710805	888661	1172566	1150895	1353442	1650395
2012	62052	11925	248496	195391	7185	464258	529905	610131	14615	36352	309121	48574	66561	442550	759989	961090	1300501	1265415	1495122	1853019
2013	35817	28333	234135	151486	4198	400521	459104	530701	20403	108457	261294	67556	74256	352196	756137	927913	1199284	1193307	1392131	1681396
2014	50866	13371	320006	143562	12411	472652	546575	631818	17983	26724	160419	39511	33911	206785	411789	508607	659206	921545	1060338	1240639
2015	31683	37579	281896	149003	3949	444294	509708	589535	16760	74363	226551	49487	36115	323175	612522	760640	1005862	1094516	1276179	1538136
2016	24649	16022	218548	106176	2147	325085	370608	424229	15019	43639	229075	52725	68066	313930	604946	758725	1018407	961254	1132770	1402944
2017	15772	15635	287974	38364	5744	319566	365853	423635	19084	45765	250039	37741	57206	270374	568222	714356	963952	917447	1083283	1343346

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	39914	16640	295066	128244	9415	431574	495194	571002	16016	39297	180188	45787	49923	256443	494752	618715	821410	962165	1119126	1341087
2019	13034	8759	230580	92355	5444	308753	353992	407071	16393	23564	154339	32777	38238	306080	468591	595550	825305	807533	952077	1194462
Mean																				
10-year	34128	19888	265812	132842	6295	404652	463313	533260	16931	55316	241814	58364	49397	345981	643168	804104	1070429	1083828	1271809	1554710

Table 3.3.4.4. Estimated pre-fishery abundance of non-maturing 1SW salmon (potential MSW returns) by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	49354	27147		267065	4630				62011	65618	398522	379655	32831	1318927	1931030	2274298	2703564			
1972	75040	25408		430224	7023				39178	59237	380197	279270	28883	1136583	1630288	1936920	2339306			
1973	118315	23864		398338	4881				23659	51070	409345	213720	31226	853884	1340893	1596675	1914796			
1974	150834	26431		429706	3262				33905	54281	445585	261786	25930	1013690	1533195	1853531	2279308			
1975	116703	21700		367377	4514				30522	46780	341356	180548	18047	728596	1145875	1360536	1635790			
1976	82191	29766		254181	2439				21038	45373	277198	177665	17629	784253	1094994	1338495	1669498			
1977	42695	38143		218553	2626				22653	58678	252156	163981	22753	998126	1241468	1534684	2005102			
1978	44643	25481		199467	4340				20637	37786	210815	86213	16263	739476	890914	1123122	1503920			
1979	51939	36149		345508	8765				40654	53647	245415	229315	21248	1019811	1320370	1629564	2074413			
1980	67204	14393		239643	5748				30708	37002	193431	307114	17766	997520	1316558	1599018	1967221			
1981	80849	16020		214276	10202				21180	26565	124451	145044	24613	691317	863822	1041442	1290949			
1982	83065	12231	833009	269713	7232	1011007	1208721	1445799	20856	42760	208630	150172	33139	700733	966816	1165497	1435119	2012260	2378890	2832371
1983	66712	14697	808343	251149	7566	962400	1151372	1378838	27088	35861	143254	109788	13446	551398	721059	888862	1143395	1718568	2048718	2458198
1984	65186	9915	755440	276160	4128	930114	1113588	1337635	20770	26245	153564	150086	17166	566268	764428	943058	1210497	1727973	2065744	2488978
1985	57483	25389	908535	280689	3842	1067787	1278941	1535829	24758	22339	191161	217373	19391	775016	1036988	1263092	1581587	2145219	2546536	3046227

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1986	71116	26203	704792	215182	7406	860668	1028659	1234173	16092	19911	227879	181581	10444	574234	857503	1041962	1305410	1748729	2074703	2488872
1987	47832	16682	560147	197555	6632	695755	831725	997283	31476	21997	168282	216035	26705	550232	837223	1029582	1297649	1562540	1867334	2243579
1988	48332	14407	426195	197181	19625	594282	707851	845007	18345	19806	161246	185261	21535	569508	807240	987324	1253114	1422962	1703497	2048287
1989	50733	14955	477653	241846	10497	667054	798061	950673	14680	19501	73207	197545	19501	514117	676777	848608	1123998	1371976	1657397	2025643
1990	64130	10353	393712	231258	13286	595737	715481	855260	12670	19280	99916	89234	10099	364752	473306	604621	841955	1091128	1330129	1635945
1991	60033	15000	412788	213766	17908	603163	723114	868070	16593	21437	83822	75253	22379	367296	471791	593548	795526	1097184	1323723	1610963
1992	62871	16916	395817	253163	20117	630881	750850	894892	8180	10585	78161	77011	52643	360832	469047	599369	833617	1128623	1361007	1673233
1993	59617	14356	387083	225314	15346	588210	704422	842236	14421	17074	113752	97596	18637	402797	521083	674397	935317	1136173	1388532	1721306
1994	40015	9220	416396	257707	7810	610910	732411	879232	7118	17595	110172	98186	15854	467456	555135	726515	1044561	1193595	1470540	1855820
1995	36467	11940	413166	194416	12538	562443	670804	804661	12811	11378	76167	103689	17359	387131	468357	617331	906208	1056431	1299013	1650413
1996	42447	6651	266346	154539	8868	399071	481195	577220	6570	12566	96702	63900	21429	282410	376008	497873	718152	796097	986492	1247009
1997	40778	9702	319556	192167	4900	473147	569567	682762	5435	7801	55673	41014	29458	226814	283445	373475	547281	775512	952477	1180917
1998	48123	11140	340625	168773	3489	476940	574718	693374	11403	15153	85898	81632	13358	262519	365918	492609	711593	870648	1073636	1353935
1999	91662	6519	472313	295859	12411	733261	882474	1059565	8006	4137	106956	83798	16380	265916	381870	497592	698861	1143804	1390258	1697571
2000	110432	7494	555472	206986	14772	747128	898594	1081472	9664	7257	97645	91599	11097	358335	443719	590483	870603	1226504	1500061	1875612
2001	97110	7071	480795	225277	10086	685041	821978	991395	8700	7847	110802	81275	13906	251306	374818	489566	693820	1088189	1321277	1621399

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	69708	7448	426174	157997	2440	554085	665254	803436	12625	12534	116923	105491	8503	287416	423798	560752	804876	1007753	1235649	1547699
2003	31775	7339	387063	121630	7439	460423	557047	671423	23353	10121	64259	88948	8987	384044	434908	594059	930115	926816	1162440	1541551
2004	26303	9052	354824	146211	5036	450439	542385	653644	14275	8965	82716	96762	11299	374485	446526	602987	910800	926706	1154791	1502261
2005	38799	8670	449157	139483	5200	536687	642723	772800	14337	7400	60810	87756	8915	457786	473176	654186	1036227	1045514	1309976	1740229
2006	56311	8365	382963	145551	4879	501958	598822	716958	13632	4564	42531	84023	9232	377829	396901	544606	839376	931532	1155626	1496162
2007	56595	10735	441339	228963	6858	618719	746059	902781	15046	5217	31640	92153	7199	501252	477454	666565	1067797	1137974	1429071	1887271
2008	24403	8652	346732	194157	6054	480183	581684	705147	7031	8080	39911	71370	7309	414477	411645	561494	881869	923670	1155523	1513403
2009	39062	12319	381639	241076	7051	563609	682688	826982	5753	16708	36947	104609	10668	545466	535780	734149	1152395	1136926	1431770	1896875
2010	30188	13767	530192	240577	16591	687135	835750	1010291	16157	8505	40463	177688	13703	701342	710249	980879	1499154	1448086	1830502	2414287
2011	36328	7769	466615	117593	18856	534453	648109	785164	12800	4843	35500	137750	32222	541026	571267	785255	1219735	1146228	1450226	1926919
2012	34949	8855	328383	134477	8000	426444	516621	625376	13207	13379	40379	135075	10240	499653	530559	731464	1123133	991490	1257448	1677410
2013	38124	10656	337726	133280	17189	442786	540148	653227	16416	8218	34107	91351	5570	340268	376490	510179	766668	851162	1059016	1365564
2014	36573	10196	426655	125747	11716	503670	613443	749438	18636	7478	36053	148705	7185	416233	481270	657364	990085	1022785	1282177	1663800
2015	39171	14291	469051	107130	4595	522508	636277	770599	7972	10668	35292	194416	13344	452272	532104	740044	1137375	1096410	1388272	1834941
2016	28353	8059	474215	99102	19271	518936	631878	770191	9059	9063	32499	152726	10745	398265	457195	635695	989027	1016419	1278402	1682460
2017	17415	8796	446582	130640	12730	507136	619035	754478	13560	9687	32833	146346	10151	227680	337479	461492	677450	876790	1086288	1373413

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	24978	5796	376841	103677	25864	443216	540672	661077	18950	4520	25176	121132	7636	290029	340547	476599	742835	816474	1026473	1337197
Mean																				
10-year	32514	10050	423790	143330	14186	514989	626462	760683	13251	9307	34925	140980	12147	441224	487294	671312	1029786	1040277	1309057	1717287

Table 3.3.4.5. Estimated number of 1SW spawners by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	12254	4719			8061				48334	31307	396831	34929	36456	246563	610586	811081	1061340			
1972	47448	4310		71897	6457				95806	25259	421794	38329	31832	275219	687743	912407	1199216			
1973	21953	5156		78070	7997				58721	27003	455507	46306	27821	343892	734874	982854	1293588			
1974	30607	5138		93788	11427				27478	19220	518246	58081	30439	323061	741390	996306	1346128			
1975	36387	6258		111948	12564				54758	29902	581713	59671	24963	288229	783037	1056542	1429980			
1976	33158	6329		109774	7001				50220	23569	392576	40061	17337	217207	561531	758670	1011269			
1977	18823	8783		74429	3206				38774	24484	341425	45022	17069	297323	592692	782374	1022854			
1978	17857	8879		58802	3813				39609	31617	297341	52689	22287	310524	594506	773442	1000146			
1979	16019	8551		74975	3874				45245	29291	273498	51974	15559	331774	593897	768096	990423			
1980	12670	1296		73399	5002				94859	13458	205127	48721	19739	221234	491567	622588	787189			
1981	11392	6694		53674	9113				75097	17217	70087	51472	15490	289710	428379	531978	690506			
1982	6822	3066		49911	8051				46510	17666	169143	43827	22348	295353	480037	608863	773423			
1983	16649	4507	160262	64809	10752	204152	258920	323545	49277	22352	359885	64144	31484	352727	711266	900169	1128886	960684	1160517	1396139
1984	18142	1638	164455	80589	15195	223107	281941	349874	81640	13681	197186	55852	12359	319216	559841	696893	875072	829662	981240	1171925
1985	23866	11263	171871	93144	18007	260642	320877	387527	30419	22388	234486	55788	16029	328686	542165	706047	916856	852427	1027514	1248167

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1986	18742	14102	152019	102629	18763	256051	309035	371437	45243	36352	322748	65551	18072	366132	688186	885721	1130029	990309	1194856	1446938
1987	22904	8316	127441	95914	15022	225682	272076	323055	79415	22656	200452	69115	15278	322250	574584	742566	973103	840170	1015163	1253312
1988	13420	12037	116954	86701	12552	203913	244121	290015	27204	40764	342843	95698	41186	443298	819162	1019293	1283949	1060369	1263880	1534429
1989	23466	6469	184637	96383	3663	266719	315747	378764	14928	22751	222109	65193	12159	488738	660014	844673	1133846	969435	1164609	1457931
1990	23420	4853	165882	97109	9880	258066	303057	356579	25141	20802	159034	46186	35040	347231	525775	649603	858348	820088	956051	1170541
1991	23087	7038	144079	83198	12405	231703	271731	319857	18148	23233	117346	46792	18307	296342	427612	532859	710686	691375	807069	989286
1992	32503	13256	122044	115927	13809	262133	300642	344033	32875	26510	158587	49345	45907	377165	572224	711509	945025	867379	1014091	1251519
1993	21914	10966	120615	113849	13692	246612	283688	323765	46912	25857	141717	72564	71753	419530	651481	802437	1074078	930005	1086905	1359671
1994	12211	3495	166718	115931	10617	262811	311553	371124	37152	21528	124689	80958	25210	424602	583920	735649	997059	887053	1049690	1311561
1995	12207	9157	108149	121245	17578	235184	270890	309877	11782	26610	178445	64631	25789	419050	594589	739844	999407	861765	1012689	1271541
1996	21022	4913	80832	138408	10431	226324	257643	292069	14393	22854	183025	49287	34723	330473	517977	648637	883034	772151	907865	1143814
1997	19164	6679	105269	158789	4799	259717	296371	336398	7514	16696	228615	45966	38289	293744	523698	643890	839145	814055	941534	1137963
1998	24029	11465	138399	163398	3847	298463	342908	391413	14427	22798	220428	51668	155328	326749	675207	808783	1033067	1010733	1154507	1384042
1999	31382	6029	127501	162703	6038	293192	336178	382944	4838	19017	232158	42425	20053	229157	458483	560718	713892	787426	898324	1059217
2000	33867	6312	213686	141547	10985	350992	409670	477236	12637	16816	351006	64726	33914	348247	696634	847461	1082943	1096329	1259239	1501740
2001	24821	5854	186234	198505	6862	362829	426130	496528	10738	15271	255814	57401	32183	371732	618886	757665	1005459	1031975	1186753	1440595

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	17144	10247	112114	211756	6642	302933	360207	424141	24674	19073	214582	54227	61726	277403	558854	668709	842849	904452	1032174	1218653
2003	16845	5478	157080	199414	3584	322696	385856	455834	16078	22924	248240	45373	33112	276271	543790	659000	853572	914544	1047209	1252725
2004	7176	15096	93822	146299	3028	225543	267117	313484	19504	22926	156546	81612	39600	382781	588524	720806	962211	850161	989876	1235077
2005	15851	13768	139829	133556	2960	261504	308498	360639	12643	33867	172908	66465	50866	383076	604071	735188	998667	902923	1046330	1314104
2006	26049	14085	111010	162496	3280	270228	319593	374641	17732	23910	126855	66906	38746	340648	513038	632366	871271	822267	954673	1195671
2007	7608	10716	61863	123630	1022	172912	206162	246499	13868	27955	223070	65286	67855	357083	627556	794767	1062177	830190	1002232	1271241
2008	8156	10059	88007	93367	1843	172762	203217	236748	13585	33738	231979	64950	42774	292153	561942	714721	971797	761728	919436	1179547
2009	14439	16829	71490	101165	1967	176802	207802	244139	3962	37232	190686	41115	26512	225950	434593	550703	744187	637574	760890	952868
2010	11667	13408	116331	92202	3318	204634	239337	277532	13188	38937	249430	81191	27845	403105	669973	855834	1164564	906648	1096619	1410414
2011	13199	11558	80400	102431	3268	183621	212985	245757	9118	27349	216827	52514	20706	230450	462748	585418	794770	671230	799708	1011944
2012	22992	5788	89976	110092	4039	203120	234732	271963	9897	15583	220784	31780	49841	293115	512972	654392	897151	743089	891000	1133956
2013	13162	14242	90542	100398	2280	190159	223310	260230	13730	46644	188194	43927	55595	224869	486382	607152	796490	703833	831377	1024491
2014	18863	6699	137674	91068	6707	222492	263913	311429	12131	11672	115878	26010	25630	130795	273753	340093	447104	524545	606855	722440
2015	11692	19904	108825	89483	2138	200203	234466	274797	11352	32999	163835	33118	27525	211204	401345	506121	682216	630537	742291	920086
2016	9104	8549	82875	76304	1245	153252	179649	209880	10171	19473	165952	35236	52379	214051	418067	525591	712774	594698	707260	894478
2017	7751	8480	109780	39629	3326	143697	171345	205237	12913	20387	181837	26188	43353	186844	392766	496968	677859	560876	671297	852918

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Russia	Swe-den	Total			France	Ice-land (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	19664	9003	121345	51554	5835	179276	210833	247404	10848	17519	131180	32679	37907	176149	343635	429958	575951	548153	643441	788987
2019	6418	5080	87600	69583	3363	147822	174149	203811	11046	10657	113076	25151	28984	214350	332559	422572	588591	503208	597325	763237
Mean																				
10-year	13451	10271	102535	82274	3552	182827	214472	250804	11440	24122	174699	38779	36976	228493	429420	542410	733747	638682	758717	952295

Table 3.3.4.6. Estimated number of MSW spawners by NEAC country or region and year.

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Total			France	Iceland (N&E)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1971	10164	2877			270				6798	7389	82349	51664	10977	131268	225656	298942	405213			
1972	10548	4566		58807	215				13498	11253	88192	92646	9585	167867	297553	395149	532191			
1973	17098	4262		65972	955				8230	10139	94860	71804	8383	145527	256977	349433	480914			
1974	29041	4010		98880	600				3832	8791	107751	53216	9138	89255	204541	281815	383103			
1975	36961	4443		86781	169				7638	9281	121210	73378	7528	162951	288641	394207	555329			
1976	28619	3655		86550	510				5613	8054	84812	37971	5233	92947	175115	242732	343314			
1977	20272	5067		71684	219				4323	7841	73264	48003	5150	149811	217154	296315	433089			
1978	10300	6598		50427	269				4447	10139	62978	41427	6705	231522	258632	364463	590195			
1979	12455	4347		44470	699				5036	6533	56693	20427	4708	181879	192753	280907	464944			
1980	12333	6056		47857	1365				10742	9125	62655	66592	5961	235611	293814	399266	595055			
1981	14692	2098		66285	301				7489	6102	46752	96108	4676	193850	275523	364312	498311			
1982	19399	2419		40741	1473				4624	4309	32444	36652	6757	117239	150698	205942	302808			
1983	21368	1834	101220	49082	954	141356	176782	217267	5018	7204	63444	41740	9473	117629	189659	250165	353961	355079	429082	536655
1984	18011	2371	103519	62099	1338	154842	189416	229697	8315	6090	43017	33418	3722	125957	168236	224423	331430	347747	416265	525837
1985	17400	1543	95899	51094	499	135732	168043	203530	6190	4391	53621	49331	4828	125643	187601	248110	363018	347191	417962	535083

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Rus-sia	Swe-den	Total			France	Ice-land (N&E)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
1986	14203	4165	114617	52330	254	149199	187493	230924	6336	3709	51059	67602	5431	152123	215948	293308	419656	394195	483465	615525
1987	18882	4359	89912	53374	1150	137397	170304	206732	3337	3253	79478	55086	2998	104820	192866	254297	360901	355044	425796	537307
1988	13388	2798	73366	44809	1227	111584	137019	164615	9202	3736	53163	71598	9985	96835	187954	252266	367521	320212	390296	506453
1989	10719	2364	77654	50848	4275	126371	147112	171397	4213	3311	40762	57787	4995	104717	161230	222183	332706	304233	370411	483601
1990	11729	2485	91214	48115	2650	133565	157636	186568	4302	3290	14891	70758	7012	131368	173344	237081	362767	326139	397471	523145
1991	15670	1731	76410	60455	3560	136542	159252	184902	3944	3282	41171	31636	3318	104692	142072	191127	303517	295470	352406	464044
1992	15116	2589	84249	58342	4945	142645	167007	194852	4972	3717	20839	24393	8921	79873	99723	145134	238979	260363	313986	411912
1993	15790	2920	78418	55800	5563	137315	160212	185935	2298	1808	24236	27725	27598	94584	132202	184888	296297	287759	346133	459703
1994	15085	2458	76804	65212	4294	142007	165191	190855	5319	2972	40183	38909	6625	116779	156512	214424	339303	316539	381339	505427
1995	9790	1557	83440	64289	2445	138684	162819	190840	2547	3013	38003	40319	5423	154688	179546	248045	405397	338651	412505	570369
1996	10116	2044	82945	63261	3971	139616	163585	189758	4567	1983	19626	42744	6782	134718	152148	215863	361034	311387	380507	525203
1997	12223	1148	57807	52875	2892	108977	128240	149185	2316	2186	38993	27198	8414	100942	135720	187952	297231	260330	316870	426813
1998	11673	1679	69655	41910	1597	107964	127591	149567	1987	1352	12527	17894	13574	77647	91262	128083	215333	213375	257081	347070
1999	13900	2272	72445	54528	1145	122180	145094	170235	4248	2834	33917	38790	5402	101585	140993	200624	306450	282330	346362	455732
2000	26482	1366	102942	58875	4053	165787	195165	227959	2988	815	44119	41190	6306	97551	150981	200110	297868	337422	397036	499016
2001	28867	1654	122645	89452	4833	212431	249201	289815	3480	1397	37001	44417	4288	145045	177926	242960	389183	416946	494797	641922

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Rus-sia	Swe-den	Total			France	Ice-land (N&E)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2002	25423	1634	106896	74315	3269	181695	213386	248895	3209	1598	47552	39811	4497	99543	154066	204737	303661	358653	420062	523510
2003	18293	2023	95649	63200	788	154677	181647	212213	4651	2326	54128	53708	2280	120748	187456	248392	365552	364176	431053	549699
2004	8328	1916	87639	48078	2428	125680	149700	177312	8756	1938	24752	45771	3260	164875	187415	257373	419972	332057	408627	574079
2005	6845	2404	79009	36364	1654	107269	127053	150343	5340	1829	37721	50152	4174	167714	205587	275049	427902	329602	403826	556721
2006	10122	2773	100951	46559	1716	137483	163151	191924	5371	1503	25491	45884	3912	215841	223905	307346	499170	383416	471955	664442
2007	14730	3127	83701	39918	1584	122311	144018	168043	5072	907	21736	44416	4407	174457	190459	259345	406048	330858	404345	554357
2008	14753	3425	125829	47401	2644	164756	194959	230093	5595	1301	15933	48785	3582	239549	234899	322934	526692	424808	519753	727393
2009	6387	3209	100079	70033	2324	155374	183815	217299	2614	1727	20150	37808	3580	200132	202962	272226	435020	382031	457717	621570
2010	10169	4397	123030	61109	2721	172359	202520	236808	2142	3387	18942	55569	5755	259610	261560	354085	568469	459555	558161	770936
2011	7899	5261	179034	72967	5654	229930	272329	319600	6019	1884	20101	92202	7040	337314	353238	478528	733853	617194	752684	1006849
2012	9470	3031	156676	64373	7285	207016	242799	283775	4782	1305	17998	73527	17475	265871	293609	394317	617480	530190	638904	865298
2013	9141	3539	111722	33554	2973	136932	161875	190468	4961	3504	20514	70891	5583	245033	268268	362372	567861	427696	525859	729559
2014	9920	4327	124106	36773	6337	153597	182722	217732	6106	2386	17074	48464	3062	163709	188253	248948	375713	362695	433941	563445
2015	9559	4011	147552	33765	4674	167547	201040	241162	6898	2030	17758	78604	3976	204943	245343	328528	492709	437855	531672	699451
2016	10227	5849	160009	31766	1963	176318	210640	250021	2946	3274	17824	103380	7454	228689	282065	379802	579974	485742	593064	796511
2017	9035	3660	162686	25047	8245	174153	210262	250982	3355	2838	16427	82753	5973	203131	243719	328116	505703	444748	540649	720010

Year	Northern NEAC								Southern NEAC									NEAC Area		
	Fin-land	Ice-land (N&E)	Nor-way	Rus-sia	Swe-den	Total			France	Ice-land (N&E)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Total			Total		
						5%	50%	95%							5%	50%	95%	5%	50%	95%
2018	5555	4023	160078	25140	5483	166348	201417	242469	5069	2766	16528	80935	5643	114981	179404	237425	343468	369429	441208	551650
2019	7951	2718	130832	31825	11797	156515	187607	223052	7098	1703	12934	69796	4235	151658	185955	251462	386358	367627	441738	579649
Mean																				
10-year	8892	4082	145572	41632	5713	174072	207321	245607	4938	2508	17610	75612	6619	217494	250141	336358	517159	450273	545788	728336

Table 3.3.5.1 Time-series of jurisdictions in northern NEAC area with established CLs and trends in the number of stocks meeting CLs.

Year	Teno River (Finland/Norway)				Norway				Russia				Sweden			
	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met
1999									85	8	7	88				
2000									85	8	7	88				
2001									85	8	7	88				
2002									85	8	7	88				
2003									85	8	7	88				
2004									85	8	7	88				
2005					0	167*	70	42	85	8	7	88				
2006					0	165*	73	44	85	8	7	88				
2007	9	5	0	0	80	167*	76	46	85	8	7	88				
2008	9	5	0	0	80	170*	87	51	85	8	7	88				
2009	9	5	0	0	439	176	68	39	85	8	7	88				
2010	9	5	0	0	439	179	114	64	85	8	7	88				
2011	9	5	0	0	439	177	128	72	85	8	7	88				
2012	9	5	0	0	439	187	139	74	85	8	7	88				
2013	25	7	2	29	439	185	111	60	85	8	7	88				
2014	25	10	4	40	439	167	116	69	85	8	7	88				

Year	TENO RIVER (FINLAND/NORWAY)				NORWAY				RUSSIA				SWEDEN			
	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met
2015	25	10	2	20	439	179	132	74	85	8	7	88				
2016	25	11	4	36	439	174	143	82	85	8	7	88	23	20	8	40
2017	25	15	4	29	439	191	170	89	85	8	7	88	24	22	6	27
2018	25	15	6	40	439	193	171	89	85	8	7	88	24	23	7	30
2019	25	15	5	33	439	NA	NA	NA	85	8	7	88	24	24	6	25

*** CL attainment retrospectively assessed, NA = data pending.**

Table 3.3.5.2. Time-series of jurisdictions in southern NEAC area with established CLs and trends in the number of stocks meeting CLs.

Year	France				Ireland				UK (England & Wales)				UK (Northern Ireland)				UK (Scotland)			
	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met
1993									61	61	33	54								
1994									63	63	41	65								
1995									63	63	26	41								
1996									63	63	31	49								
1997									64	64	21	33								
1998									64	64	30	47								
1999									64	64	19	30								
2000									64	64	27	42								
2001									64	58	21	36								
2002									64	64	28	44	10	10	4	40				
2003									64	64	20	31	10	10	4	40				
2004									64	64	42	66	10	10	3	30				
2005									64	64	32	50	10	10	4	40				
2006									64	64	38	59	10	10	3	30				
2007					141	141	45	32	64	64	33	52	10	6	2	33				
2008					141	141	54	38	64	64	43	67	10	5	3	60				

Year	France				Ireland				UK (England & Wales)				UK (Northern Ireland)				UK (Scotland)			
	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met
2009					141	141	56	40	64	64	23	36	10	6	2	33				
2010					141	141	56	40	64	64	38	59	10	7	2	29				
2011	28	28	*	*	141	141	58	41	64	64	41	64	11	9	3	33	173	173	112	65
2012	28	28	*	*	141	141	58	41	64	64	36	56	19	15	7	47	173	173	110	64
2013	30	27	*	*	143	143	57	40	64	64	21	33	19	16	8	50	173	173	97	56
2014	33	30	*	*	143	143	57	40	64	64	14	22	19	17	4	24	173	173	83	48
2015	33	27	*	*	143	143	55	38	64	64	23	36	19	17	7	41	173	173	92	53
2016	35	35	*	*	143	143	48	34	64	64	22	34	19	17	13	76	173	173	89	51
2017	35	35	*	*	143	143	44	31	64	64	30	47	19	16	8	50	173	173	84	49
2018	35	35	3	9	143	143	41	29	64	64	14	22	19	16	7	44	173	173	51	29
2019	35	35	1	3	143	143	40	28	64	64	8	13	19	18	6	33	173	NA	NA	NA

NA = data pending; *revised data pending for France.

Table 3.3.6.1. Estimated survival of wild smolts (%) to return to homewaters (prior to coastal fisheries) for various monitored rivers in the NE Atlantic area.

Smolt migration year	Iceland (1)			Norway (2)		France (8)			
	Ellidaar	R.Vesturdalsa (4)		R. Imsa		Nivelle (5)	Scorff	Oir	Bresle
	1SW	1SW	2SW	1SW	2SW	All ages	All ages	All ages	All ages
1975	20.80								
1980									
1981				17.30	4.00				
1982				5.30	1.20				
1983				13.50	1.30				
1984				12.10	1.80				4.96
1985	9.40			10.20	2.10	16.82			4.61
1986				3.80	4.20	2.34		31.99	8.20
1987				17.30	5.60	2.51		42.54	8.38
1988	12.70			13.30	1.10	2.98		47.70	
1989	8.10			8.70	2.20	2.07		10.44	
1990	5.40			3.00	1.30	4.36		6.70	
1991	8.80			8.70	1.20	7.43		23.12	
1992	9.60			6.70	0.90	7.98		17.11	3.94
1993	9.80			15.60		4.83		20.70	2.98
1994	9.00					1.30		25.57	5.79
1995	9.40		1.45	1.80	1.50	2.09	9.81	35.85	2.68
1996	4.60	2.51	0.37	3.50	0.90	2.70	21.73	5.41	2.23
1997	5.30	1.00	1.51	1.70	0.30	2.33	5.69	37.87	4.51
1998	5.30	1.53	1.04	7.20	1.00	2.36	4.97	21.20	2.50
1999	7.70	1.30	1.22	4.20	2.20	2.27	11.29	92.72	9.79
2000	6.30	1.14	0.68	12.50	1.70	4.11	9.72	9.76	7.33
2001	5.10	3.40	1.32	3.60	2.23	0.40	5.06	22.88	
2002	4.40	1.11	2.31	5.50	0.90	0.67	22.20	10.79	2.28
2003	9.10	5.47	0.59	3.50	0.70	1.69	11.04	28.43	4.49

Smolt migration year	Iceland (1)			Norway (2)		France (8)			
	Ellidaar	R.Vesturdalsa (4)		R. Imsa		Nivelle (5)	Scorff	Oir	Bresle
	1SW	1SW	2SW	1SW	2SW	All ages	All ages	All ages	All ages
2004	7.70	5.68	0.60	5.90	1.40	1.44	6.31	14.24	5.01
2005	6.40	2.47	0.91	3.70	1.80	0.98	8.33	23.93	2.45
2006	7.10	1.75	0.95	0.80	5.80	3.32	7.07	14.95	3.22
2007	19.25	0.89	0.30	0.80	0.60	2.41	4.96	12.49	3.26
2008	14.90	2.59	1.07	1.10	2.30	3.73	3.01	7.59	1.98
2009	14.20	1.33	1.57	2.40	3.10	2.12	6.49	15.98	14.93
2010	8.60	1.97	1.11	1.70	1.10	1.61	4.45	18.02	5.84
2011	6.10	1.31	0.57	3.90	2.90	2.84	5.00	14.71	3.21
2012	10.90	2.06		3.50	1.70	0.73	8.52	23.13	2.95
2013	4.30		0.33	2.20	2.40	1.63	9.20	20.54	6.61
2014	7.20	1.62		3.00	0.80	1.10	5.77	9.71	6.97
2015	10.90			1.40	1.40	1.32	9.31	13.73	3.92
2016	7.90		2.00	4.10	1.30	0.52	9.21	12.69	4.90
2017	10.80	2.30		3.50	1.60		5.02	13.29	8.79
2018	7.80			3.10					
Mean (11)	8.93	2.18	1.05	5.95	1.90	2.97	8.44	19.78	5.13
five-year	8.22	1.96	1.17	2.84	1.50		7.70	13.99	6.24
ten-year	9.58	1.88	1.11	2.68	1.86	1.73	6.60	14.94	6.01

Notes:

1	Microtags.
2	Carlin tags, not corrected for tagging mortality.
3	Microtags, corrected for tagging mortality.
4	Assumes 50% exploitation in rod fishery.
5	From 0+ stage in autumn.
6	Incomplete returns.
7	Assumes 30% exploitation in trap fishery.
8	France data based on returns to freshwater.
9	Minimum count. High flows hindered sampling effort.
10	Bush 2SW data based on returns to freshwater.
11	Time-series mean.

Table 3.3.6.1 Cont'd. Estimated survival of wild smolts (%) to return to homewaters (prior to coastal fisheries) for various monitored rivers in the NE Atlantic area.

Smolt migration year	Ireland			UK(Scotland) (2)		UK(N. Ireland) (5)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (3)	2SW (10)	1SW	MSW	1SW	MSW	1SW	MSW
1975													
1980	17.90	1.06	5.3				0.59						
1981	9.20	3.76	12.3	8.24	3.79		0.92						
1982	20.90	3.33	12.2	11.22	4.95								
1983	10.00	1.84	8.6				1.69						
1984	26.20	1.98	19.8	6.00	4.00		1.45						
1985	18.90	1.75	19.3	13.63	5.35		1.92						
1986			20.0			31.30	1.94						
1987	16.60	0.71	26.9	10.43	3.89	35.10	0.44						
1988	14.60	0.69	22.9			36.20	0.85						
1989	6.70	0.71	7.1	6.62	4.15	25.00	1.44						
1990	5.00	0.63	16.0	5.98	3.13	34.70	1.76						
1991	7.30	1.26	21.7	7.61	3.11	27.80	2.22						
1992	7.30		15.9	10.87	6.46	29.00	1.99						

Smolt migration year	Ireland			UK(Scotland) (2)		UK(N. Ireland) (5)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (3)	2SW (10)	1SW	MSW	1SW	MSW	1SW	MSW
1993	10.80	0.07	23.9	14.45	6.09		1.99	6.30	2.50				
1994	9.80	1.35	26.9	10.93	3.58	27.10	0.75	1.30	1.20				
1995	8.40	0.07	14.6	8.44	3.82		2.50	2.70	0.40				
1996	6.50	1.17	18.3	5.86	2.70	31.00	2.14	4.80	2.10				
1997	12.70	0.75	15.6	7.19	4.19	19.80	0.72	6.20	3.40				
1998	5.50	1.06	12.4	2.55	1.35	13.40	0.52	2.30	3.70				
1999	6.40	0.91	14.9	6.78	3.78	16.50	0.75	5.00	12.40				
2000	9.40		22.5	6.04	2.80	10.10	0.15	2.00	0.90				
2001	7.20	1.08	16.6	4.70	2.86	12.40	0.27	4.30	0.00				
2002	6.00	0.53	12.3	2.22	1.95	11.30	0.23	2.90	0.70	3.60	1.40	5.60	1.74
2003	8.30	2.10	19.4			6.80	0.35	2.60	0.40	6.10	1.80	4.83	0.94
2004	6.30	0.80	12.8			6.80	0.44	4.50	1.00	6.00	1.50	5.29	2.90
2005			8.1	6.66	2.78	5.90	0.61	5.10	0.50	6.40	1.20		
2006	3.60	0.70	12.9	3.28	3.40	14.00	0.82	4.30	1.50	3.50	2.40	5.11	2.22
2007	1.30	1.60	8.4	4.99	3.98	8.30	0.80	1.30	0.70	3.50	3.40	5.69	1.30
2008	1.70	1.00	8.2	6.40	5.30	3.97	0.69	2.50	1.30	1.70	0.90	3.13	1.63

Smolt migration year	Ireland			UK(Scotland) (2)		UK(N. Ireland) (5)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (3)	2SW (10)	1SW	MSW	1SW	MSW	1SW	MSW
2009	6.00	1.00	8.9	9.00	8.65	5.92	0.95	4.80	1.10	8.20	1.90	7.68	2.58
2010	2.90	1.20	7.5			3.96	1.34	1.90	1.00	3.40	5.00	8.64	2.40
2011	2.36	0.00	10.8			2.67	0.53	0.00	0.30	1.10	1.90	1.50	1.80
2012	1.49	0.00	9.4			11.70	1.79	4.80		2.50		3.20	2.10
2013	2.23	0.30	4.5			4.60	0.91	1.90	1.40		4.70	1.50	2.10
2014	2.85	0.50	8.00			2.90	0.33		0.50			2.00	2.70
2015	5.50	0.60	7.80			6.70	0.51	0.50	1.90	4.20	2.30	5.90	3.00
2016	6.90		7.50			3.80	0.66	0.40	4.10	3.50	1.60	4.40	2.00
2017	3.60		7.10			3.20	0.68			5.00	5.20	2.60	1.90
2018			6.70			2.80		1.00		3.70		1.60	
Mean (11)	8.29	1.08	13.69	7.50	4.00	14.67	1.04	3.06	1.87	4.16	2.51	4.29	2.09
five-year	4.22	0.47	6.98			4.24	0.62	0.93	1.98	4.23	3.45	3.28	2.34
ten-year	3.55	0.58	7.97	7.70	6.98	4.94	0.84	2.10	1.45	3.70	2.94	4.05	2.22

Notes:

1 **Microtags.**

2 **Carlin tags, not corrected for tagging mortality.**

3	**Microtags, corrected for tagging mortality.**
4	**Assumes 50% exploitation in rod fishery.**
5	**From 0+ stage in autumn.**
6	**Incomplete returns.**
7	**Assumes 30% exploitation in trap fishery.**
8	**France data based on returns to freshwater.**
9	**Minimum count. High flows hindered sampling effort.**
10	**Bush 2SW data based on returns to freshwater.**
11	**Time-series mean.**

Table 3.3.6.2. Estimated survival of hatchery smolts (%) to return to homewaters (prior to coastal fisheries) for various monitored rivers in the NE Atlantic area.

Smolt migration year	Iceland[(1)]		Norway[(2)]				Sweden[(2)]	
	R. Ranga		R. Imsa (3)		R. Drammen		R. Lagan	
	1SW	2SW	1SW	2SW	1SW	2SW	1SW	2SW
1980								
1981			10.10	1.30				
1982			4.20	0.60				
1983			1.60	0.10				
1984			3.80	0.40	3.50	3.00	11.80	1.10
1985			5.80	1.30	3.40	1.90	11.80	0.90
1986			4.70	0.80	6.10	2.20	7.90	2.50
1987			9.80	1.00	1.70	0.70	8.40	2.40
1988			9.50	0.70	0.50	0.30	4.30	0.60
1989	1.58	0.08	3.00	0.90	1.90	1.30	5.00	1.30
1990	0.84	0.19	2.80	1.50	0.30	0.40	5.20	3.10
1991	0.02	0.04	3.20	0.70	0.10	0.10	3.60	1.10
1992	0.37	0.05	3.80	0.70	0.40	0.60	1.50	0.40
1993	0.66	0.05	6.50	0.50	3.00	1.00	2.60	0.90
1994	1.22	0.16	6.20	0.60	1.20	0.90	4.00	1.20
1995	1.09	0.10	0.40	0.00	0.70	0.30	3.90	0.60
1996	0.17	0.03	2.10	0.20	0.30	0.20	3.50	0.50
1997	0.32	0.06	1.00	0.00	0.50	0.20	0.60	0.50
1998	0.46	0.02	2.40	0.10	1.90	0.70	1.60	0.90
1999	0.36	0.04	12.00	1.10	1.90	1.60	2.10	
2000	0.91	0.06	8.40	0.10	1.10	0.60		
2001	0.37	0.10	3.30	0.30	2.50	1.10		
2002	0.35		4.50	0.80	1.20	0.80		
2003	0.20		2.60	0.70	0.30	0.60		
2004	0.60		3.60	0.70	0.40	0.40		

Smolt migration year	Iceland[1]		Norway[2]				Sweden[2]	
	R. Ranga		R. Imsa (3)		R. Drammen		R. Lagan	
	1SW	2SW	1SW	2SW	1SW	2SW	1SW	2SW
2005	1.04		2.80	1.20	0.30	0.70		
2006	1.00		1.00	1.80	0.10	0.60		
2007	1.80		0.60	0.70	0.20	0.10		
2008	2.40		1.80	2.20	0.10	0.30		
2009			1.30	3.30				
2010	0.49		2.60	1.90				
2011	0.93		1.70	0.80				
2012	0.90		1.90	0.20				
2013	0.29		3.00	0.70				
2014	1.10		1.60	0.30				
2015	0.30		1.60	0.80				
2016	0.30		2.00	0.30				
2017	0.70		4.30	0.20				
2018	0.30		1.20					
Mean (4)	0.73	0.08	3.76	0.80	1.34	0.82	4.86	1.20
five-year	0.54		2.50	0.46				
ten-year	0.82		2.18	1.12	0.10	0.20		

Notes:

1 **Micro-tagged.**

2 **Carlin-tagged, not corrected for tagging mortality.**

3 **Since 1999 only one-year old smolts included.**

4 **Time-series mean.**

Table 3.3.6.2 Cont'd. Estimated survival of hatchery smolts (%) to return to homewaters (prior to coastal fisheries) for various monitored rivers in the NE Atlantic area.

Smolt migration year	Ireland										UK(N. Ireland)[3]	
	R. Shannon	R. Screebe	R. Burrishoole[1]	R. Delphi/ R. Burrishoole[4]	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[2]	R. Corrib Galway[2]	R. Erne	R. Bush 1+ smolts	R. Bush 2+ smolts
1980	8.63		5.58				8.32	0.94				
1981	2.80		8.14				2.00	1.50				
1982	4.05		10.96				16.32	2.70	16.15			
1983	3.88		4.55					2.82	4.09		1.90	8.10
1984	4.97	10.37	27.08				2.27	5.15	13.17	9.44	13.30	
1985	17.81	12.33	31.05				15.75	1.41	14.45	8.23	15.40	17.50
1986	2.09	0.43	9.40				16.42		7.69	10.81	2.00	9.70
1987	4.74	8.40	14.13				8.76		2.16	6.97	6.50	19.40
1988	4.92	9.25	17.21				5.51	4.47		2.94	4.90	6.00
1989	5.03	1.77	10.50				1.71	5.98	4.83	1.19	8.10	23.20
1990	1.33		11.41		0.20		2.52	0.25	2.27	2.62	5.60	5.60
1991	4.25	0.31	13.65	10.78	6.19		0.76	4.87	4.03	1.28	5.40	8.80
1992	4.35	1.35	7.39	10.01	1.67	4.18		0.94	0.57		6.00	7.80
1993	2.91	3.36	11.99	14.34	6.48	5.45		0.98			1.10	5.80
1994	5.21	1.86	14.29	3.94	2.71	10.82			5.30		1.60	

Smolt migration year	Ireland										UK(N. Ireland)[3]	
	R. Shannon	R. Screebe	R. Burrishoole[1]	R. Delphi/ R. Burrishoole[4]	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[2]	R. Corrib Galway[2]	R. Erne	R. Bush 1+ smolts	R. Bush 2+ smolts
1995	3.63	4.12	6.57	3.42	1.73	3.47		2.38			3.10	2.40
1996	2.93	1.81	5.35	10.63	6.74	3.45					2.00	2.30
1997	5.97	0.37	13.32	17.30	5.64	5.25	7.00			7.74	-	4.10
1998	3.12	1.30	4.93	7.16	3.13	2.88	4.92	3.35	2.89	2.61	2.30	4.50
1999	0.96	2.83	8.15	19.92	8.25	1.97			3.56	3.30	2.70	5.80
2000	1.17	3.82	11.81	19.53	13.24	5.43	3.55	6.69		4.00	2.80	4.40
2001	1.98	2.46	9.73	17.25	7.40	3.16	1.95	3.40		6.00	1.10	2.20
2002	1.01	4.12	9.17	12.57	4.90	2.00	1.93		2.03	1.89	0.68	3.07
2003	1.17		5.95	3.71	1.48	1.65	4.31		1.17	0.96	2.45	1.87
2004	0.41	1.78	9.36	7.64	2.31	1.77	2.23		4.40	3.13	0.71	1.89
2005	0.64	3.37	4.40	10.97		0.97	0.96		4.76	0.87	1.80	1.70
2006	0.27	1.35	5.17	3.68	1.48		0.19	0.30	0.16	0.86	2.00	3.75
2007	0.50	0.77	7.11		3.64				3.49	0.66		
2008		0.19	1.35		1.38		0.05		1.62			
2009	0.34	0.19	2.33		1.48		0.07		1.34	1.14		
2010	0.20	0.10	3.00		1.90		0.09	1.40	1.43	0.90		
2011	0.40		5.20		1.30		0.09	2.00	0.36	0.50	0.80	1.86

Smolt migration year	Ireland										UK(N. Ireland)[3]	
	R. Shannon	R. Screebe	R. Burrishoole[1]	R. Delphi/ R. Burrishoole[4]	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[2]	R. Corrib Galway[2]	R. Erne	R. Bush 1+ smolts	R. Bush 2+ smolts
2012	0.50		3.20		1.80		0.22	6.60		1.90	2.19	3.46
2013	0.20	0.30	3.20		1.70		0.05	1.40	0.92	0.70	1.34	1.21
2014	0.10	0.70	4.40		2.30		0.10	1.60	1.20	1.00	0.75	0.67
2015	0.40		3.50		0.30		0.10	2.20	1.10	1.30	2.89	1.44
2016	0.60		3.50		2.40		0.03	2.20		0.70	0.52	2.61
2017	0.40		3.50		0.80		0.02	1.30	0.70	1.50	0.51	0.89
2018			4.50		0.40		0.00	1.50		1.30	0.31	0.42
Mean (4)	2.81	2.93	8.62	10.80	3.32	3.74	3.49	2.63	3.92	2.98	3.31	5.41
five-year	0.34	0.50	3.62		1.50		0.06	1.74	0.98	1.04	1.20	1.36
ten-year	0.35	0.30	3.32		1.54		0.08	2.34	1.08	1.07	1.29	1.73

Notes:

1 **Return rates to rod fishery with constant effort.**

2 **Different release sites.**

3 **Micro-tagged.**

4 **Time-series mean.**

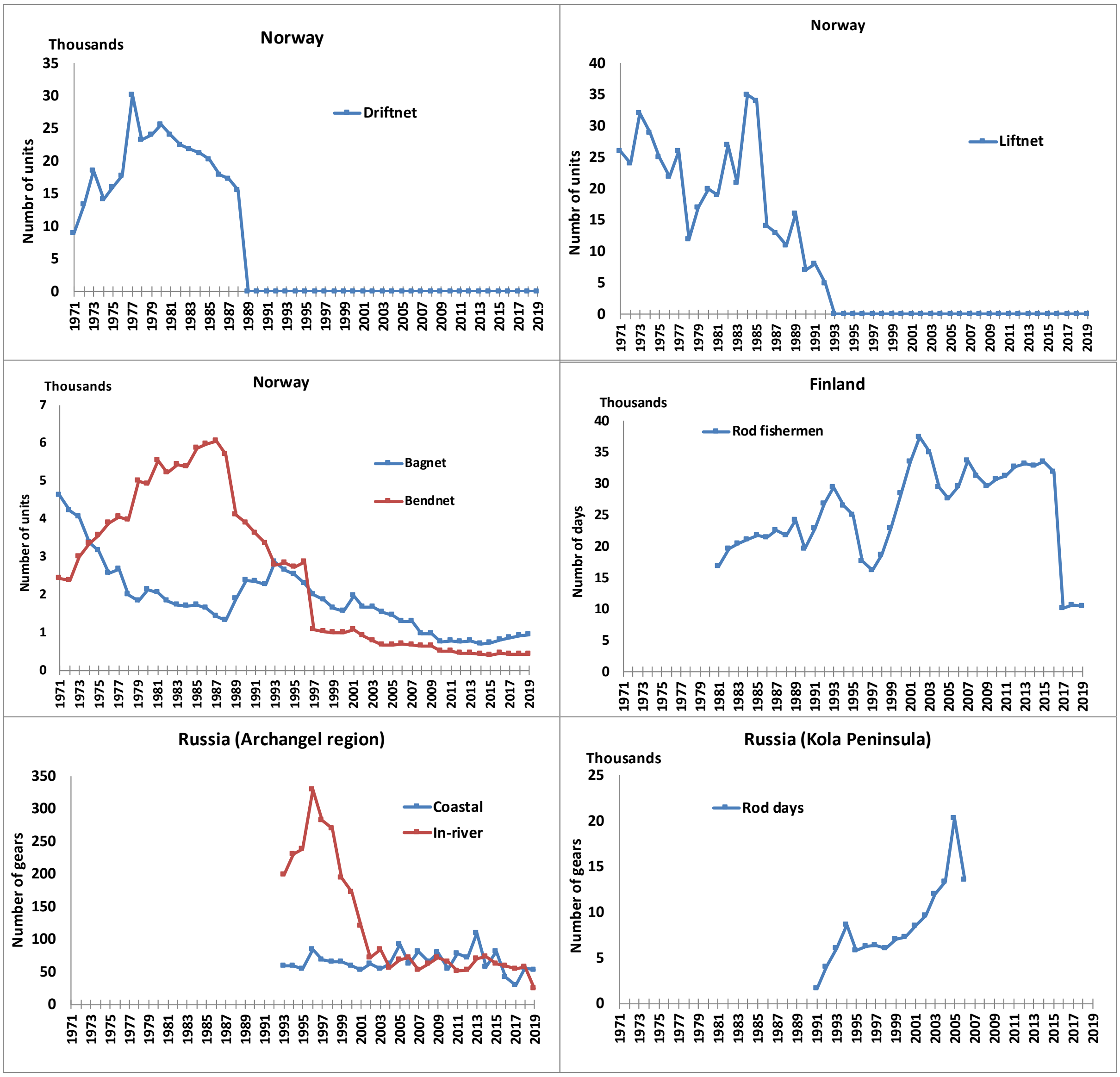


Figure 3.1.3.1. Overview of effort as reported for various fisheries and countries in the Northern NEAC area, 1971–2019. Notice that some of the y-axes are given in thousands.

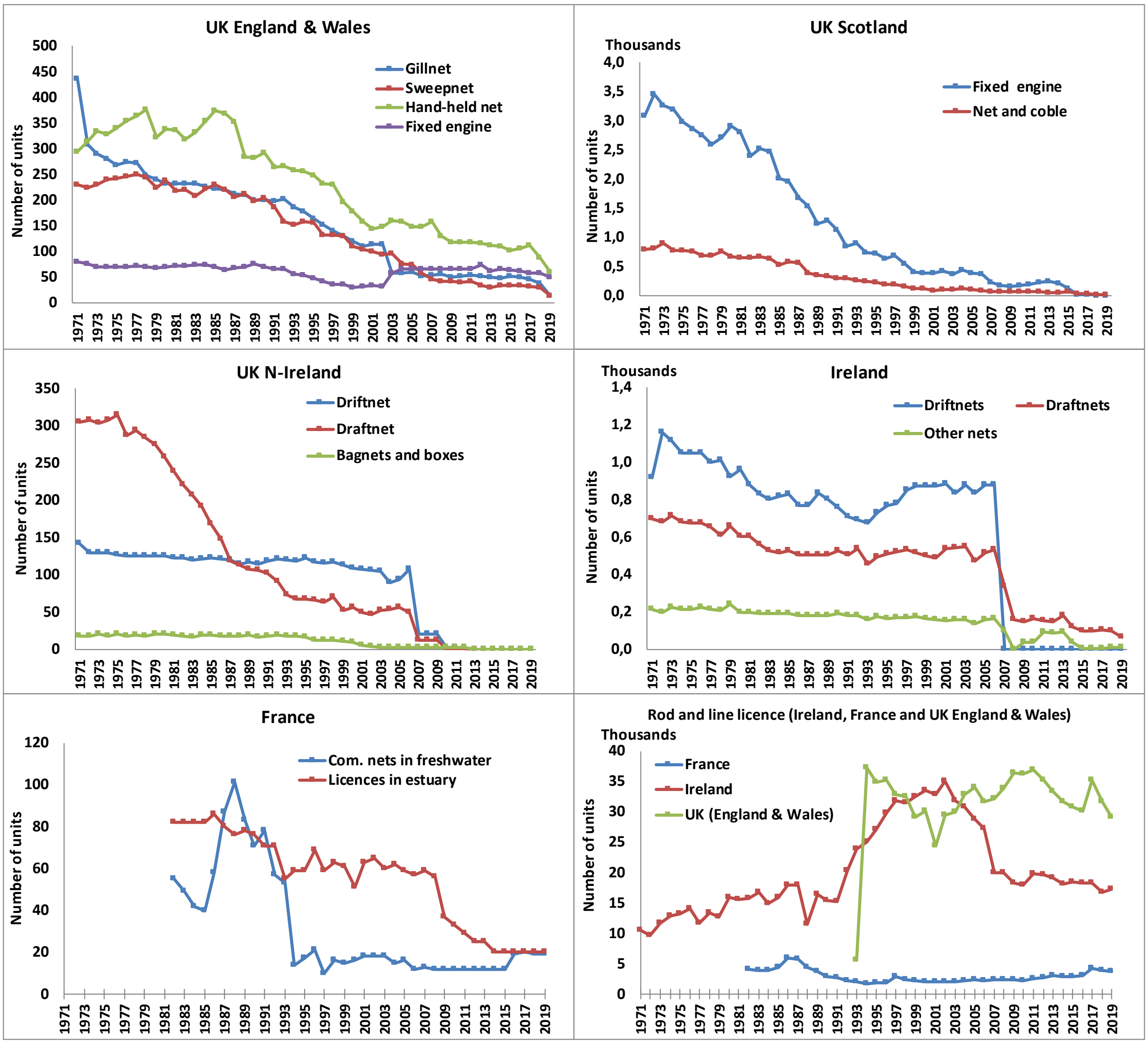


Figure 3.1.3.2. Overview of effort as reported for various fisheries and countries in the Southern NEAC area, 1971–2019. Notice all the y-axes on the right panel are given in thousands.

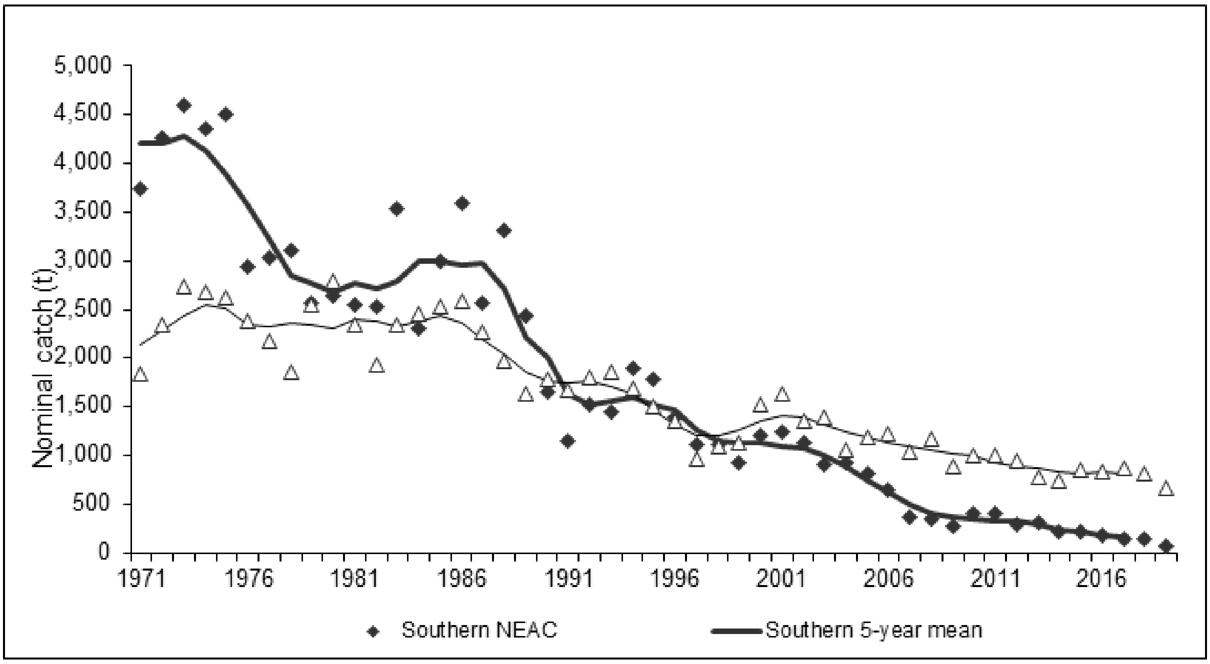


Figure 3.1.4.1. Nominal catches of salmon and 5-year running means in the Southern and Northern NEAC areas, 1971–2019.

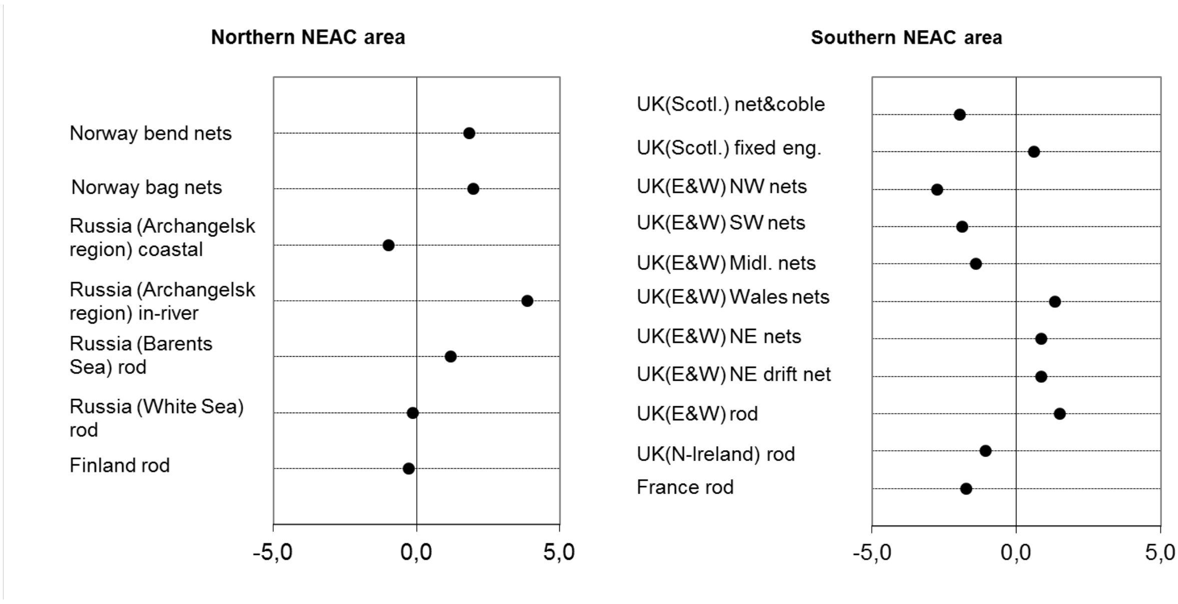


Figure 3.1.5.1. Proportional change (%) over years in cpue estimates in various rod and net fisheries in Northern and Southern NEAC area.

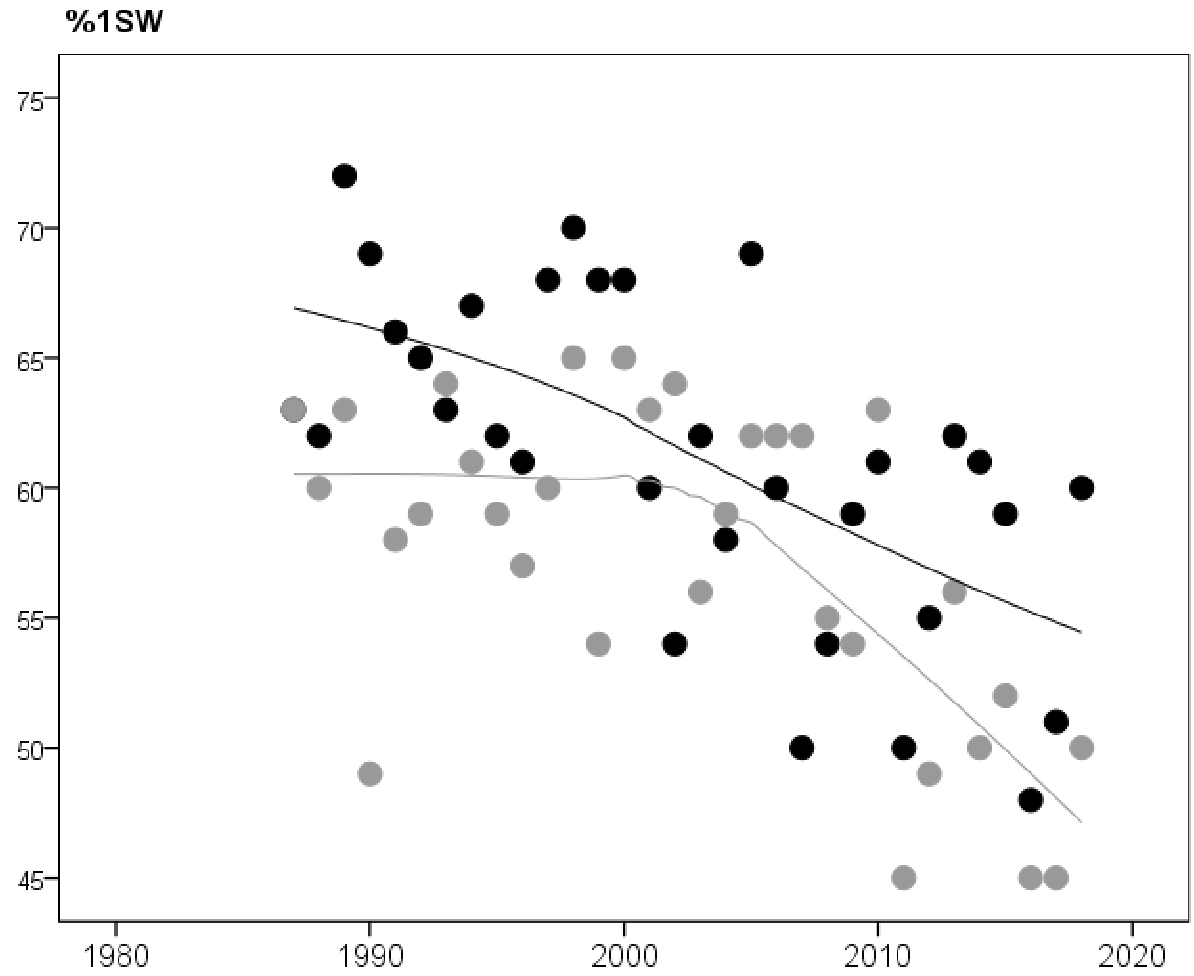


Figure 3.1.6.1. Percentage of 1SW salmon in the reported catch for the Northern (black dots) and Southern (grey dots) stock complexes, 1987–2019. Curves represent Northern (black line) and Southern (grey line) stock complexes with a Loess smoother (span =85%) applied to the data.

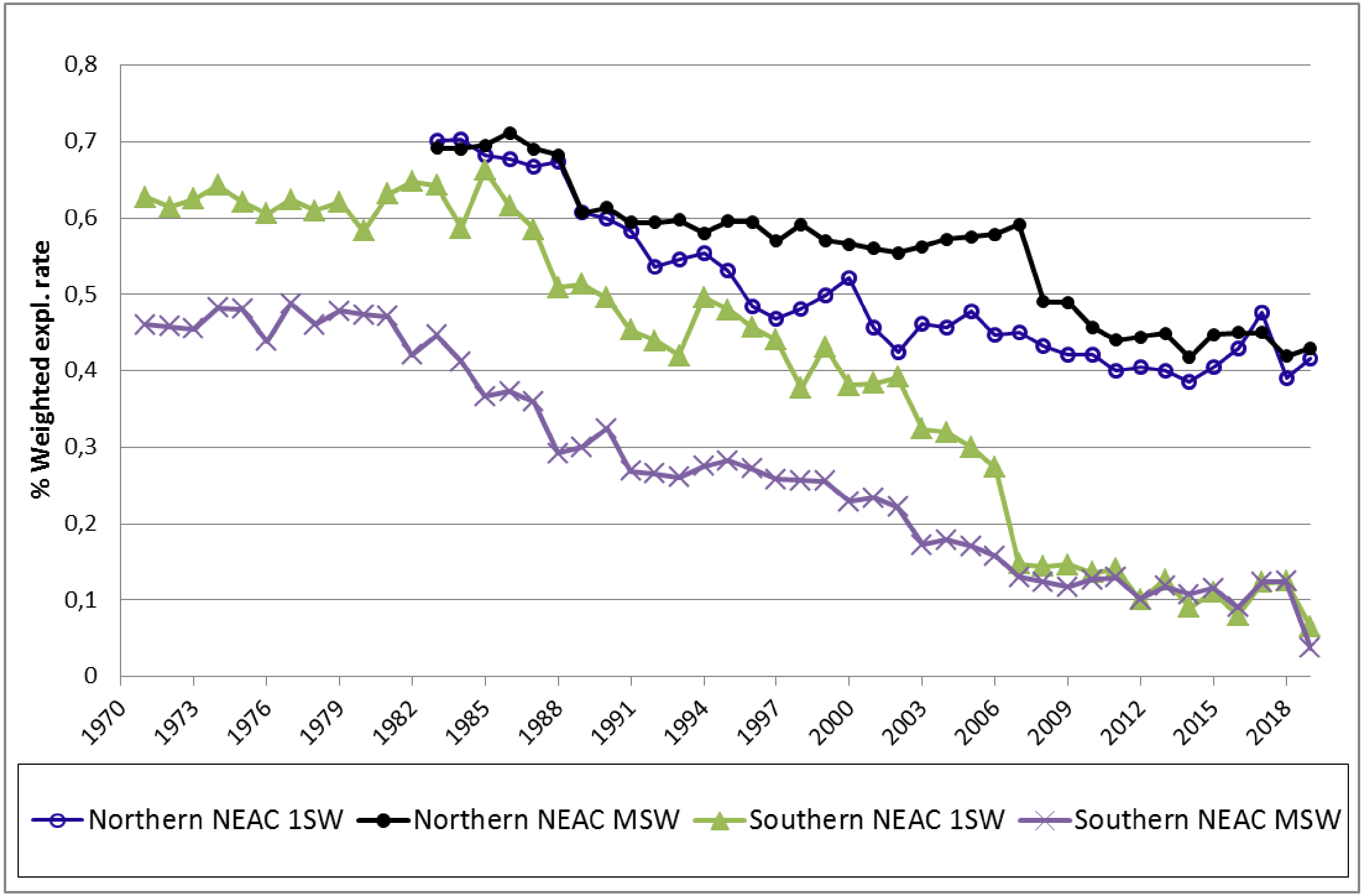


Figure 3.1.9.1. Mean annual exploitation rate of wild 1SW and MSW salmon by fisheries in Northern and Southern NEAC countries.

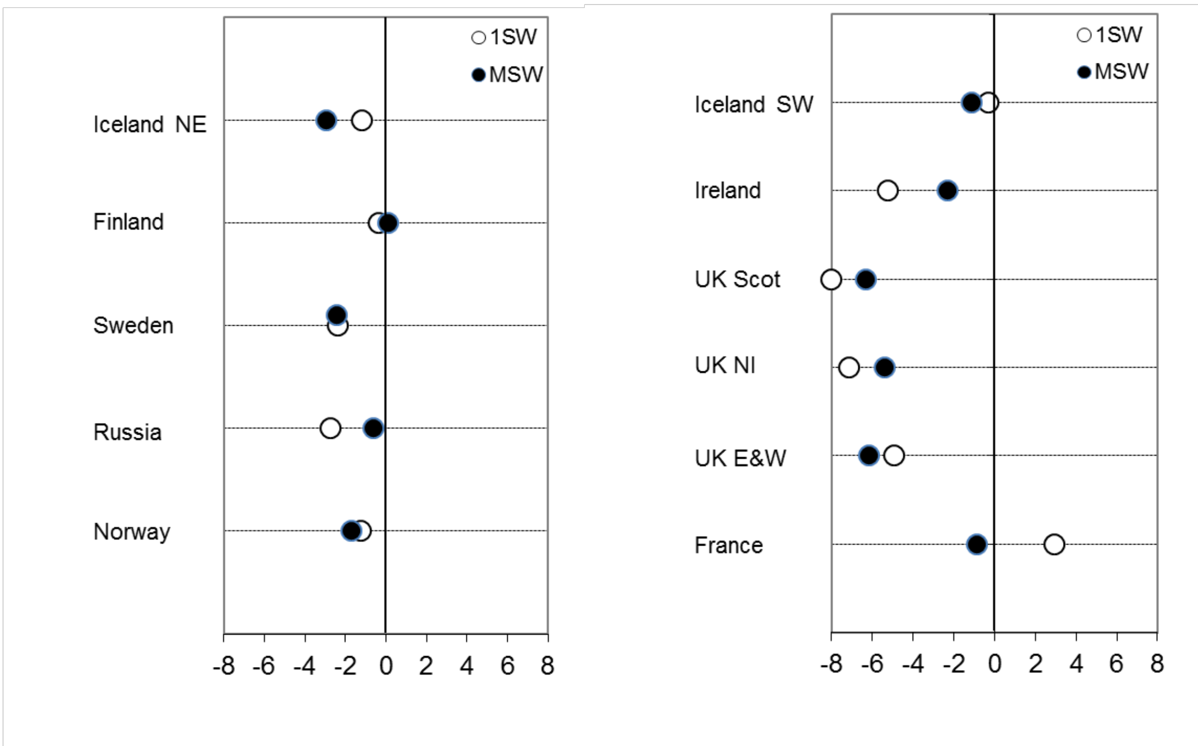


Figure 3.1.9.2. The rate of change (%) of exploitation of 1SW and MSW salmon in Northern NEAC (left) and Southern NEAC (right) countries.

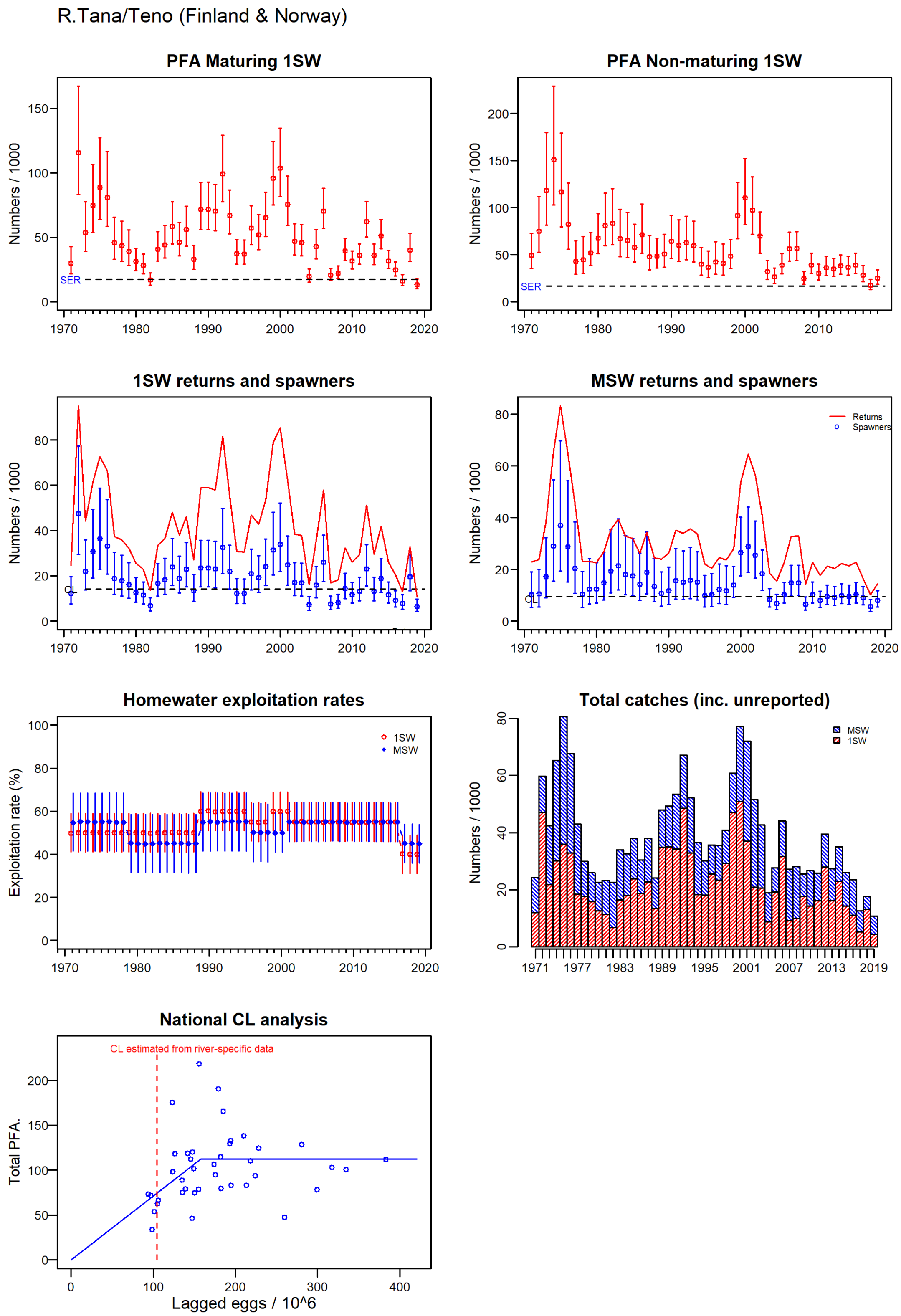


Figure 3.3.4.1a. Summary of fisheries and stock description, River Teno / Tana (Finland and Norway combined). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

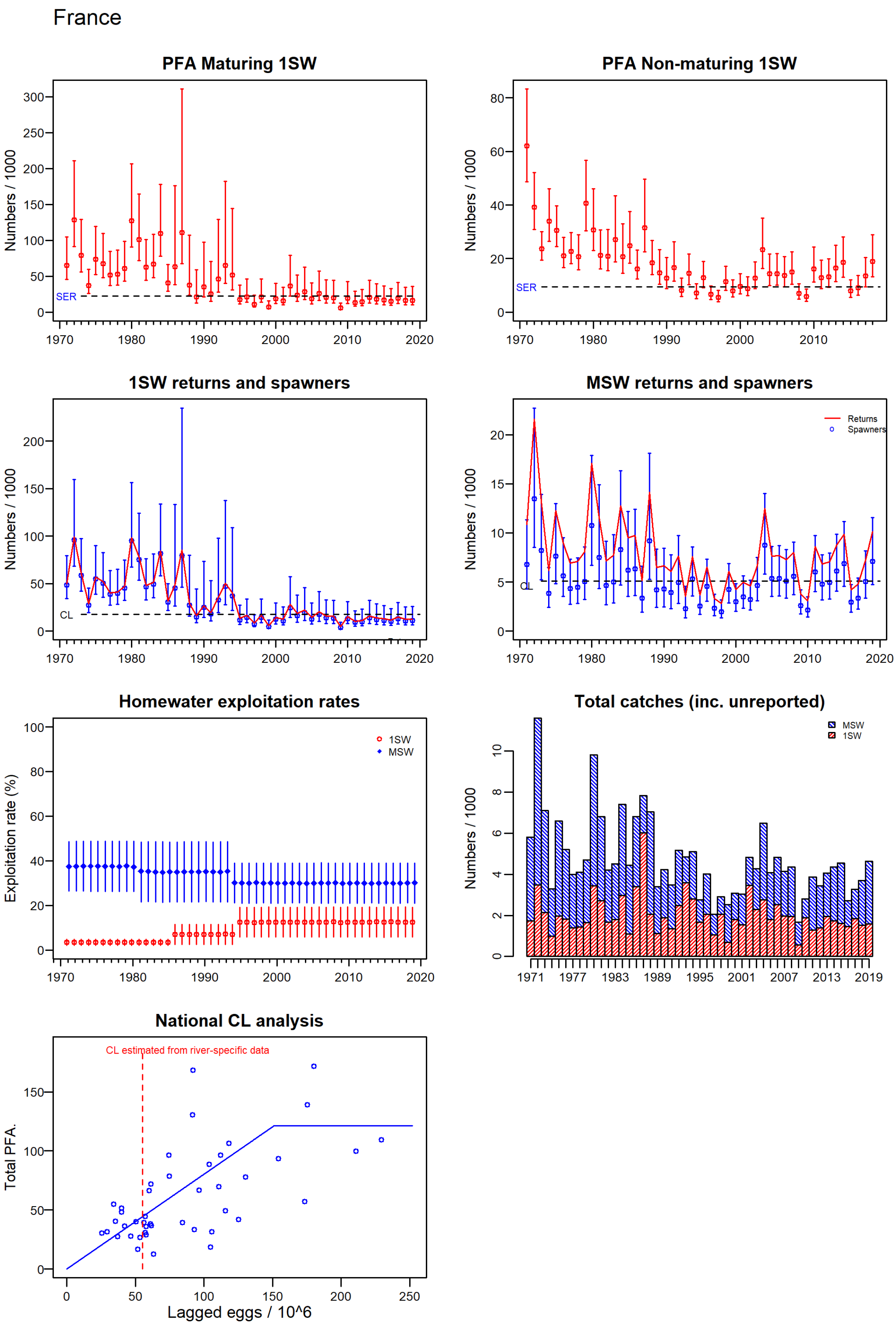


Figure 3.3.4.1b. Summary of fisheries and stock description, France. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

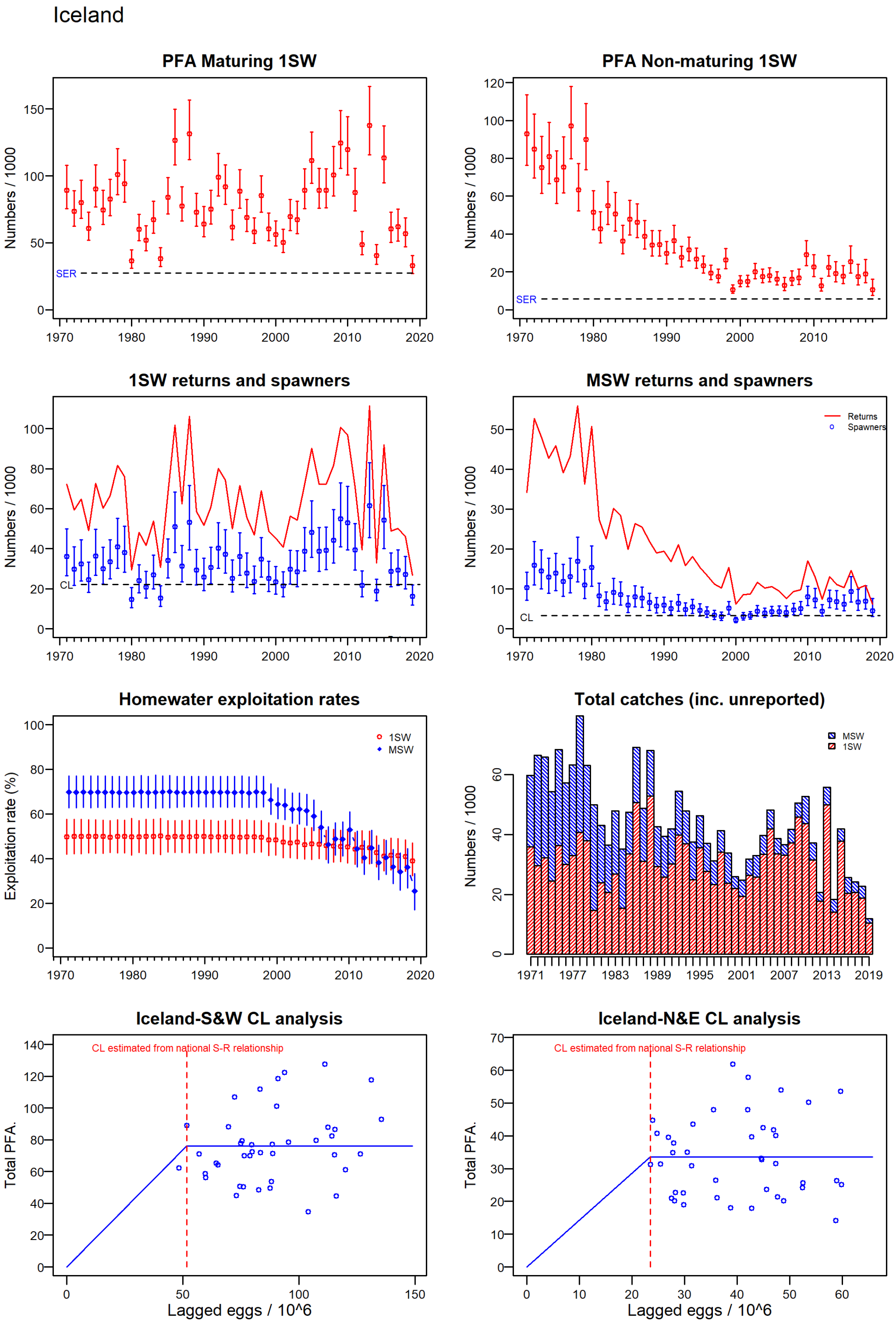


Figure 3.3.4.1c. Summary of fisheries and stock description, Iceland. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

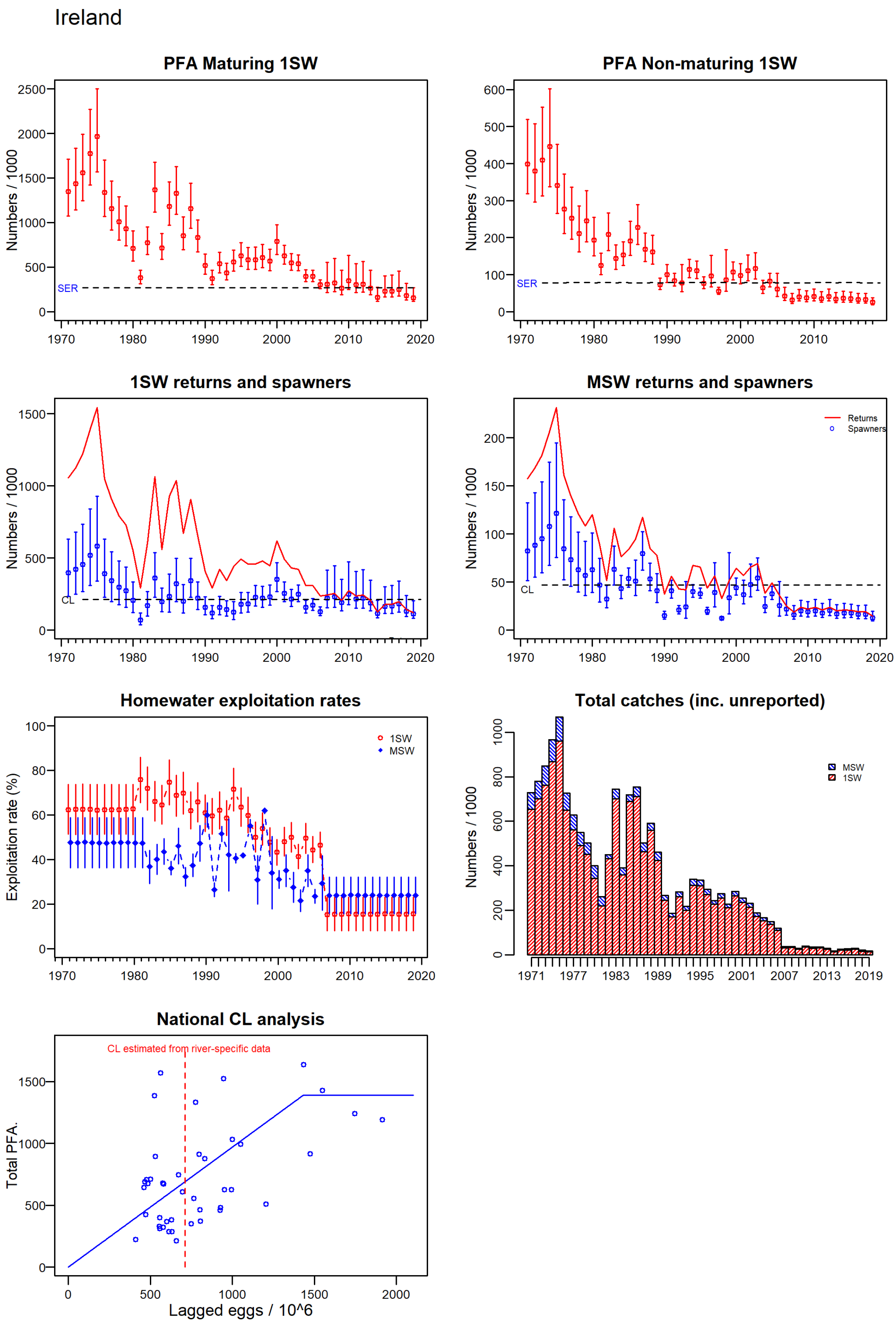


Figure 3.3.4.1d. Summary of fisheries and stock description, Ireland. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

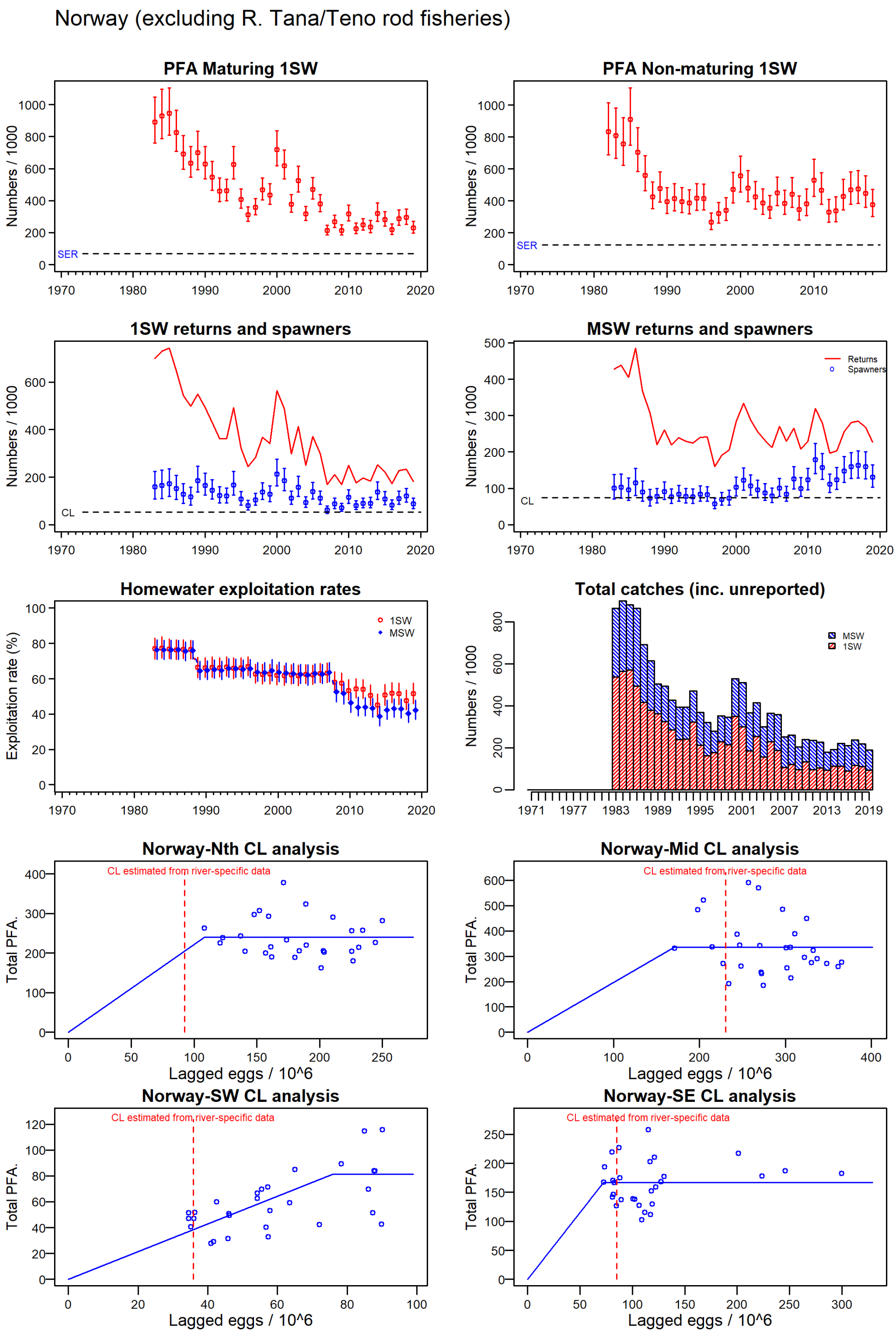


Figure 3.3.4.1e. Summary of fisheries and stock description, Norway (minus Norwegian catches from the R. Teno/Tana). The river-specific CLs, which are used for assessment purposes, are included on the regional CL analysis plots (for comparison, the CLs estimated from the regional S–R relationships are at the inflection points).

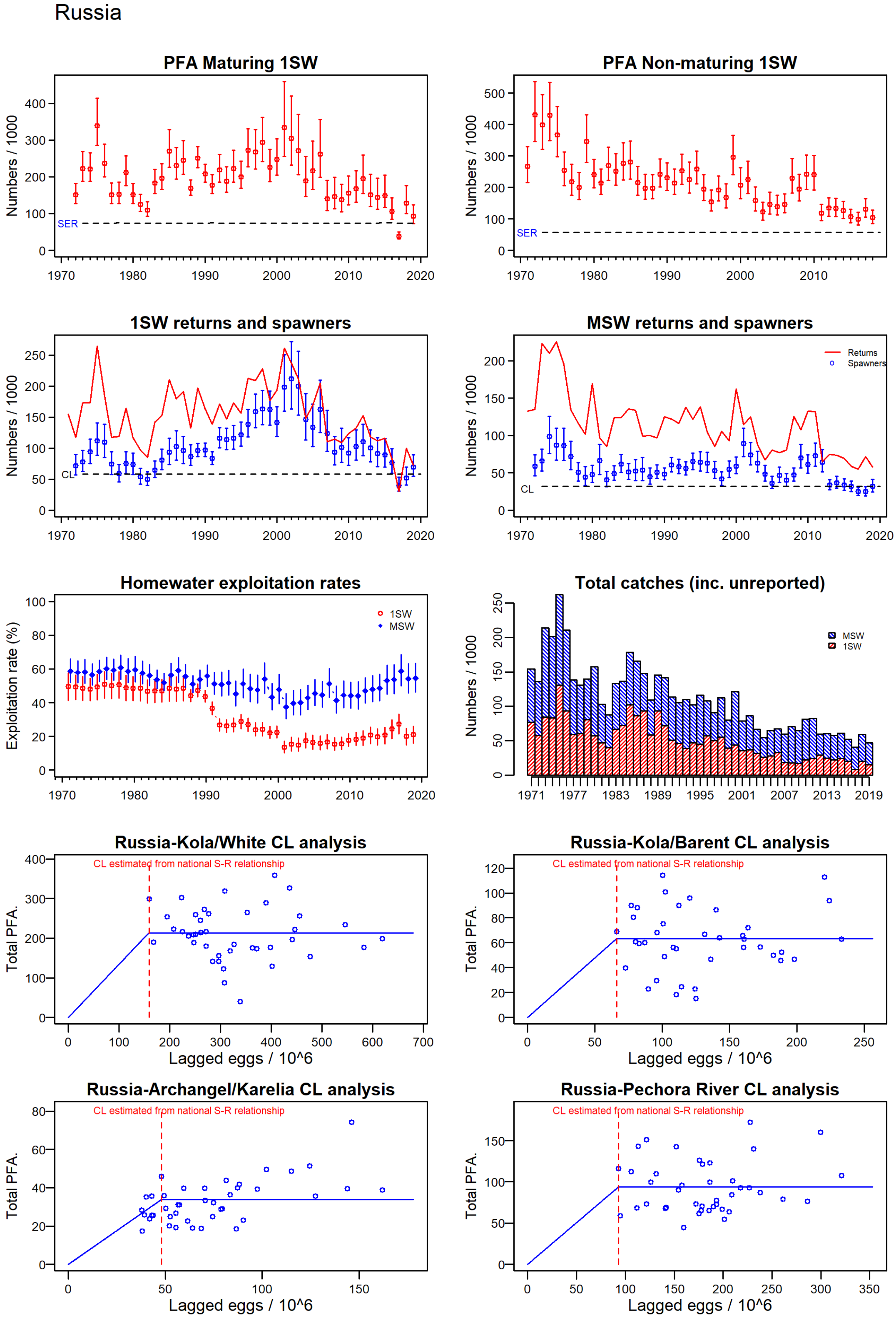


Figure 3.3.4.1f. Summary of fisheries and stock description, Russia. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

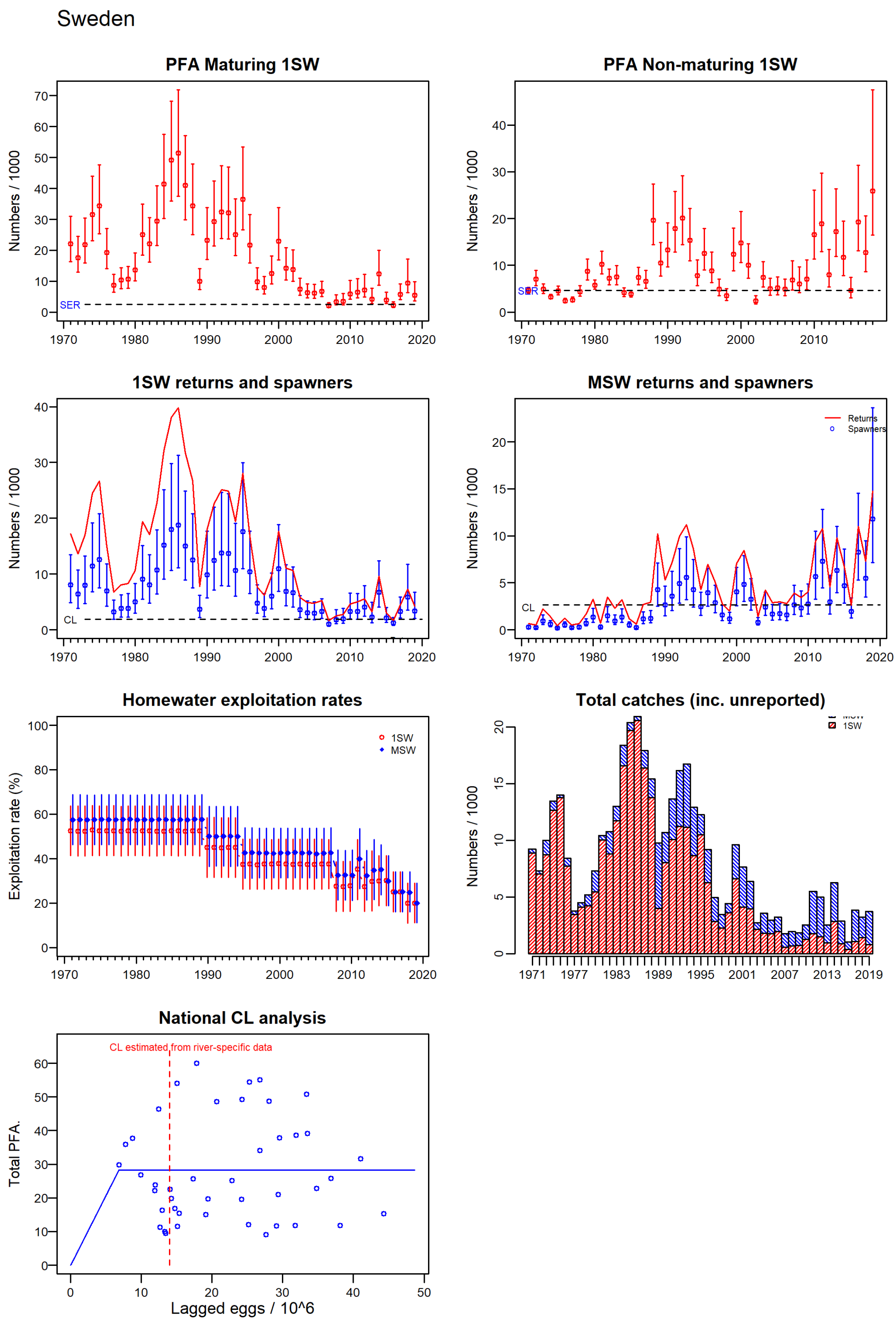


Figure 3.3.4.1g. Summary of fisheries and stock description, Sweden. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

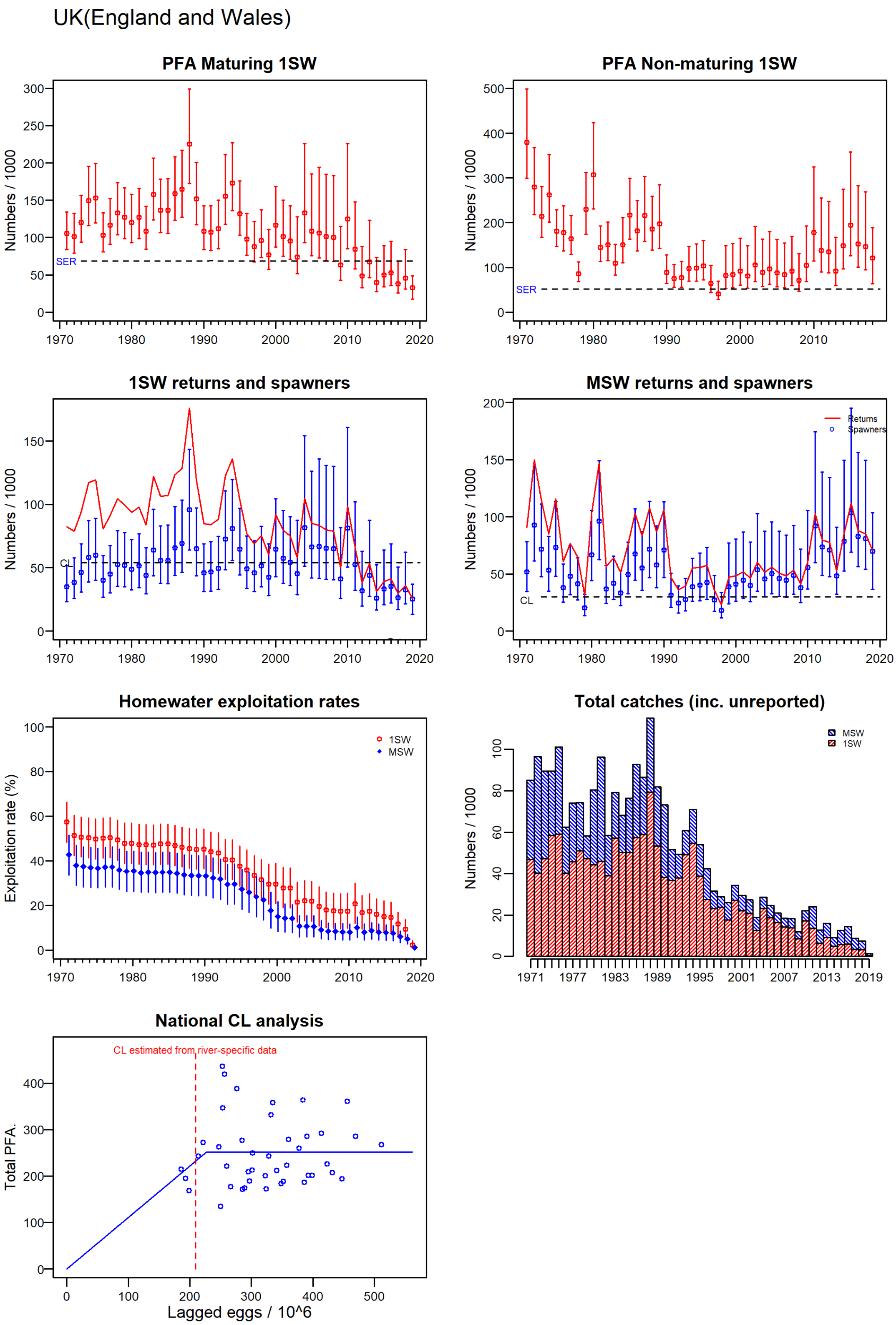


Figure 3.3.4.1h. Summary of fisheries and stock description, UK (England & Wales). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

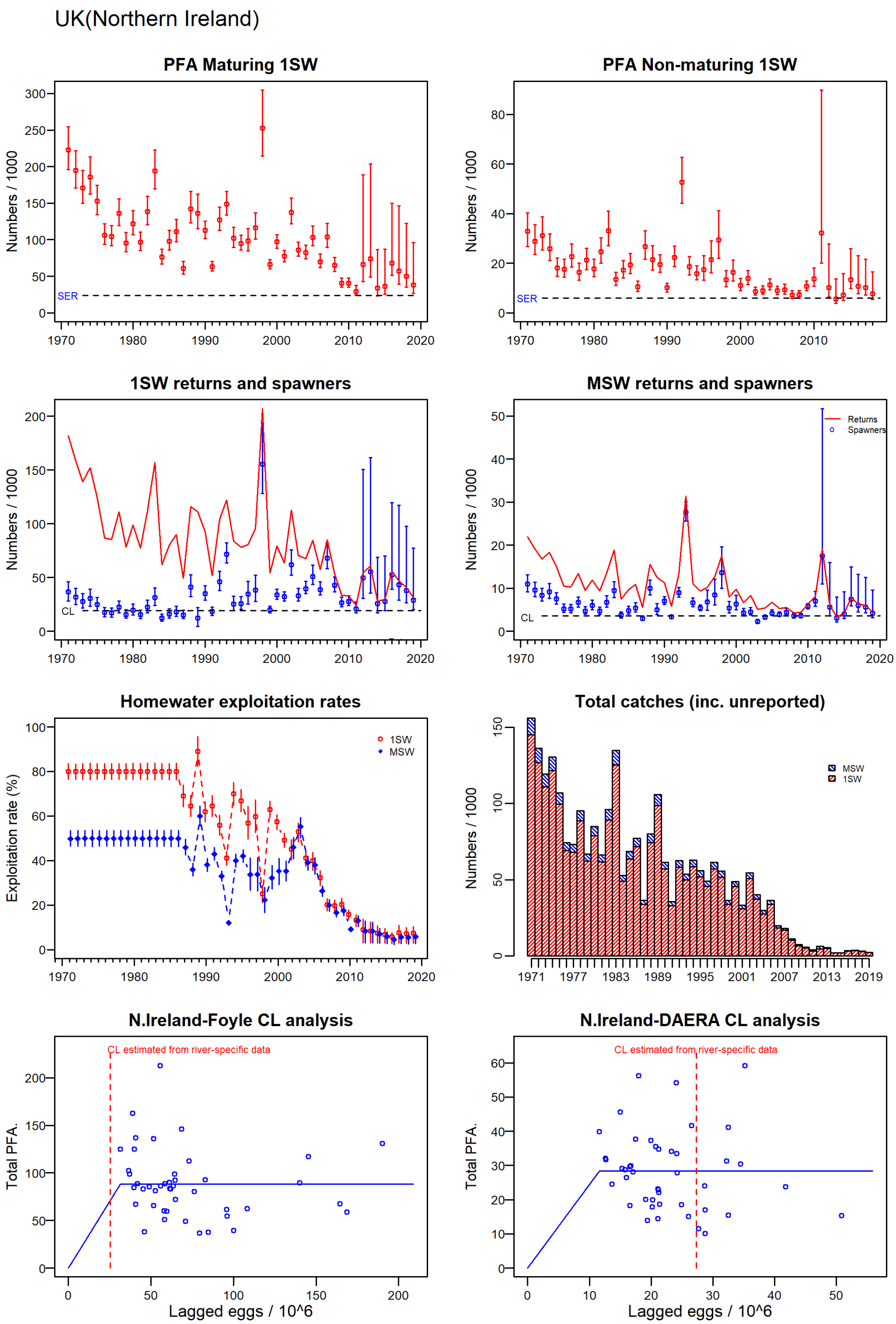


Figure 3.3.4.1i. Summary of fisheries and stock description, UK (Northern Ireland). The river-specific CLs, which are used for assessment purposes, are included on the regional CL analysis plots (for comparison, the CLs estimated from the regional S–R relationships are at the inflection points).

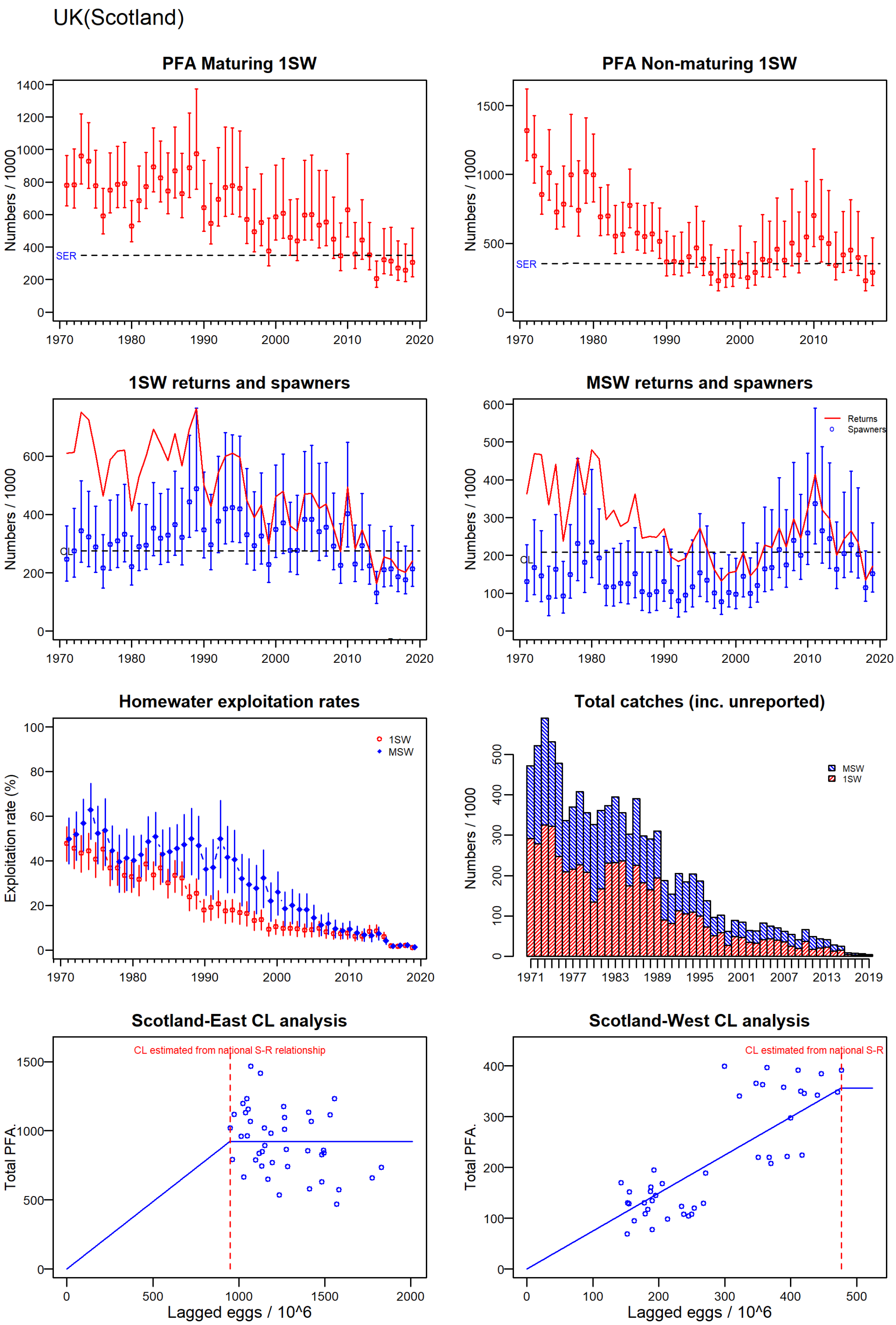


Figure 3.3.4.1j. Summary of fisheries and stock description, UK (Scotland). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

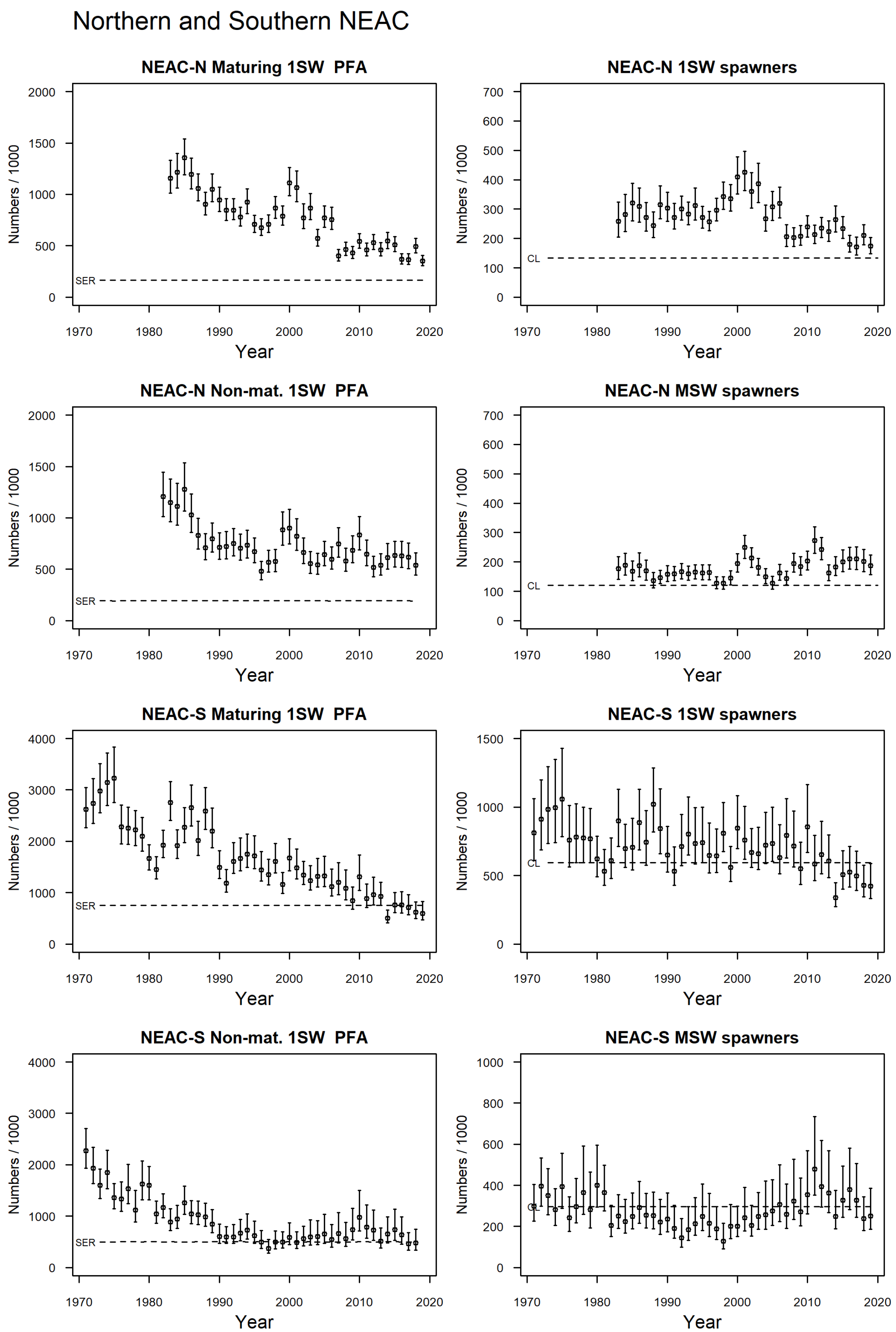


Figure 3.3.4.2. Estimated PFA (left panels) and spawning escapement (right panels) with 90% confidence limits, for maturing 1SW (1SW spawners) and non-maturing 1SW (MSW spawners) salmon in northern (NEAC-N) and southern (NEAC-S) NEAC stock complexes.

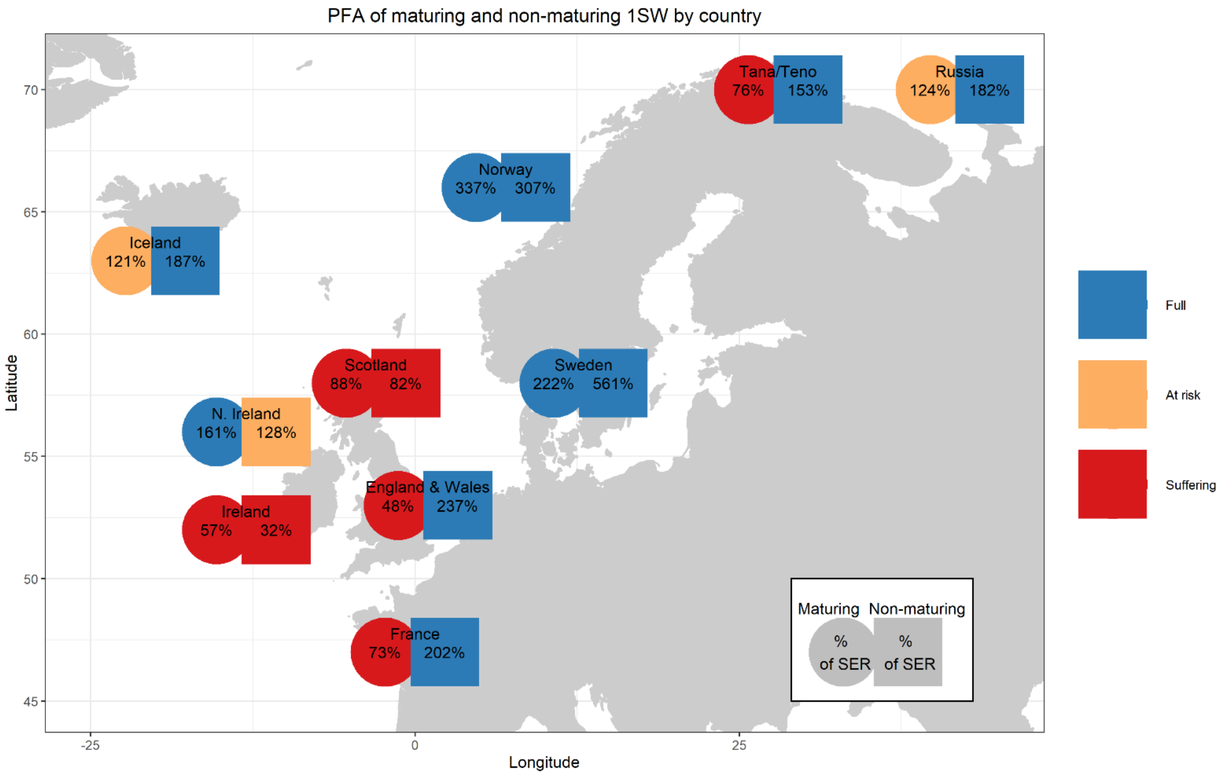


Figure 3.3.4.3. PFA of maturing (2019) and non-maturing (2018) in percent of spawner escapement reserve (% of SER). The percent of SER is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the SER), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the SER, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the SER).

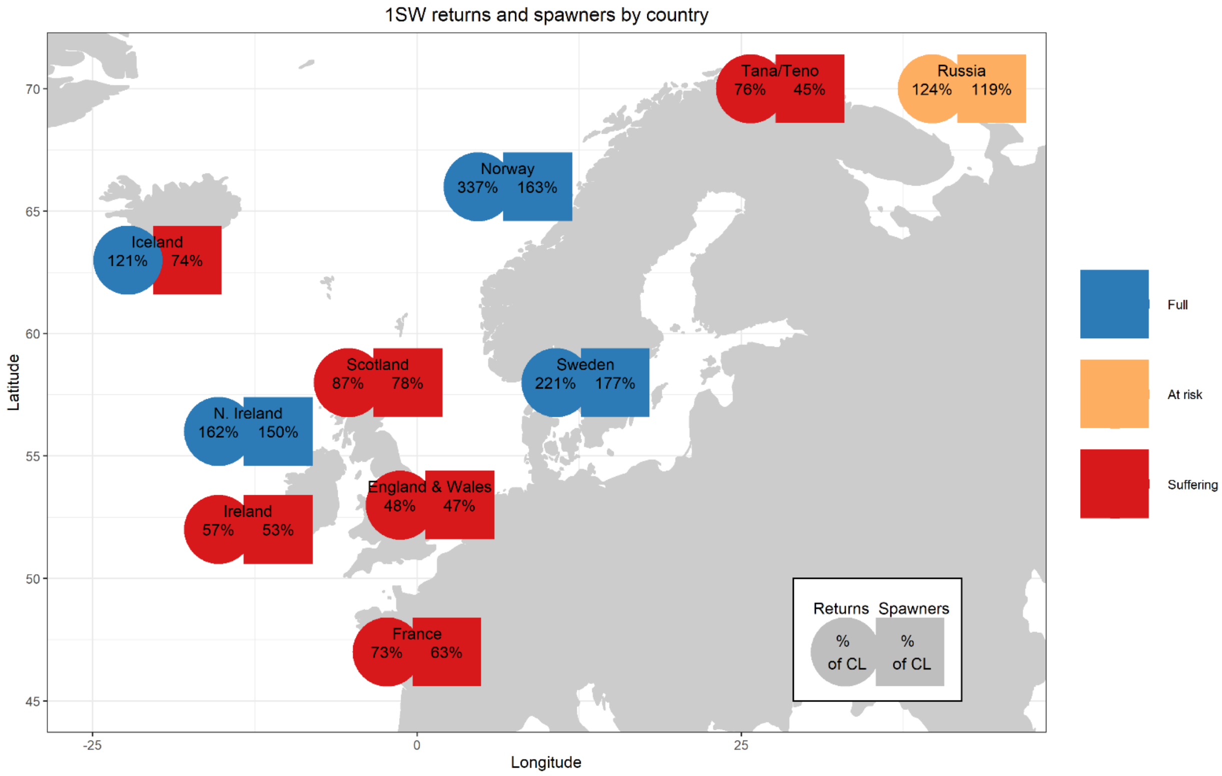


Figure 3.3.4.4. 1SW returns and spawners in percent of conservation limit (% of CL) for 2019. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the CL), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the CL, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the CL).

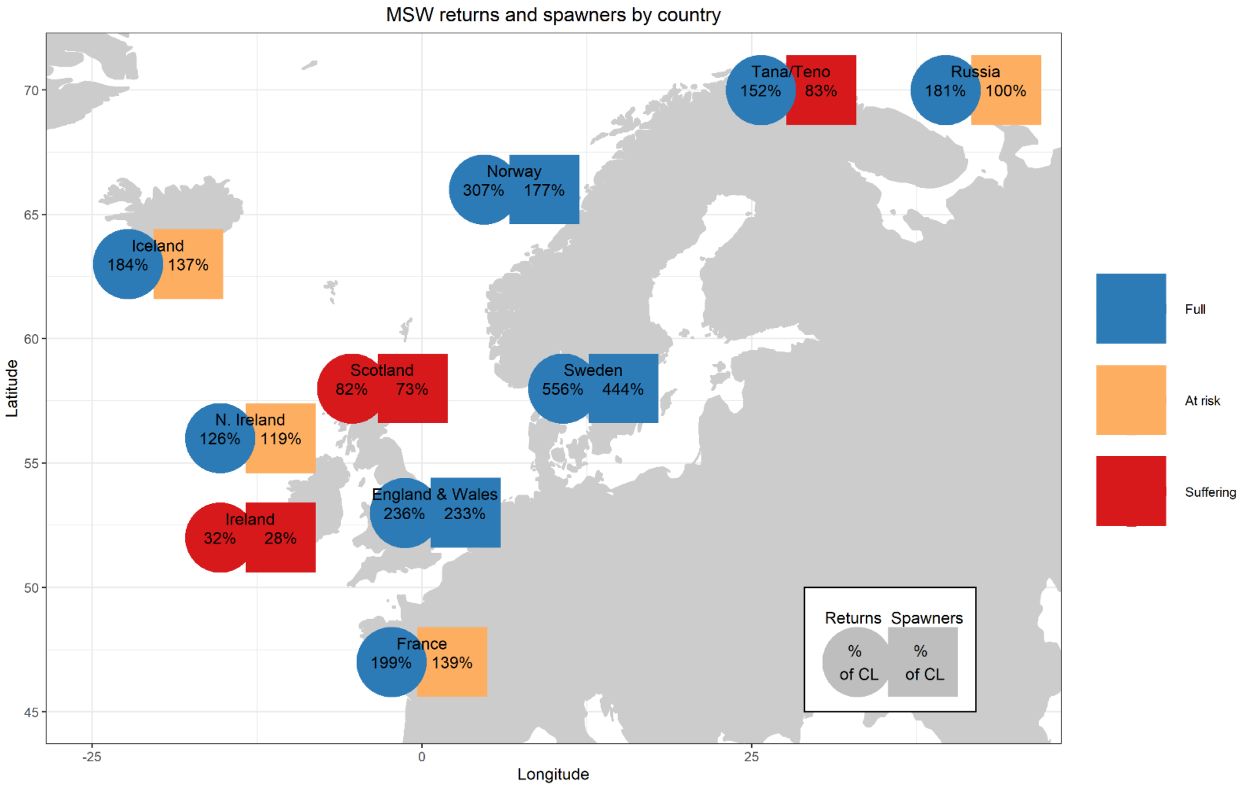


Figure 3.3.4.5. MSW returns and spawners in percent of conservation limit (% of CL) for 2019. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the CL), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the CL, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the CL).

Figure 3.3.4.6. 1SW returns and spawners in percent of region-specific conservation limit (% of CL) for 2019. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the CL), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the CL, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the CL).

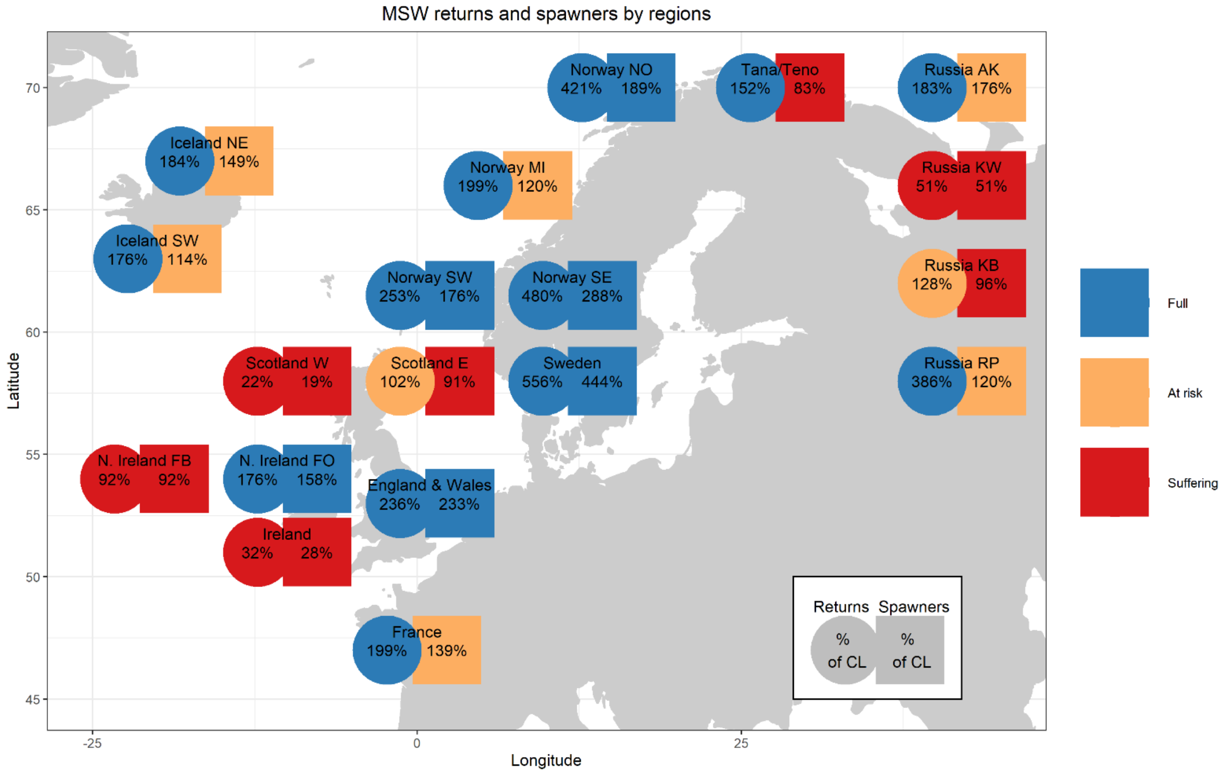


Figure 3.3.4.7. MSW returns and spawners in percent of region-specific conservation limit (% of CL) for 2019. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the CL), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the CL, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the CL).

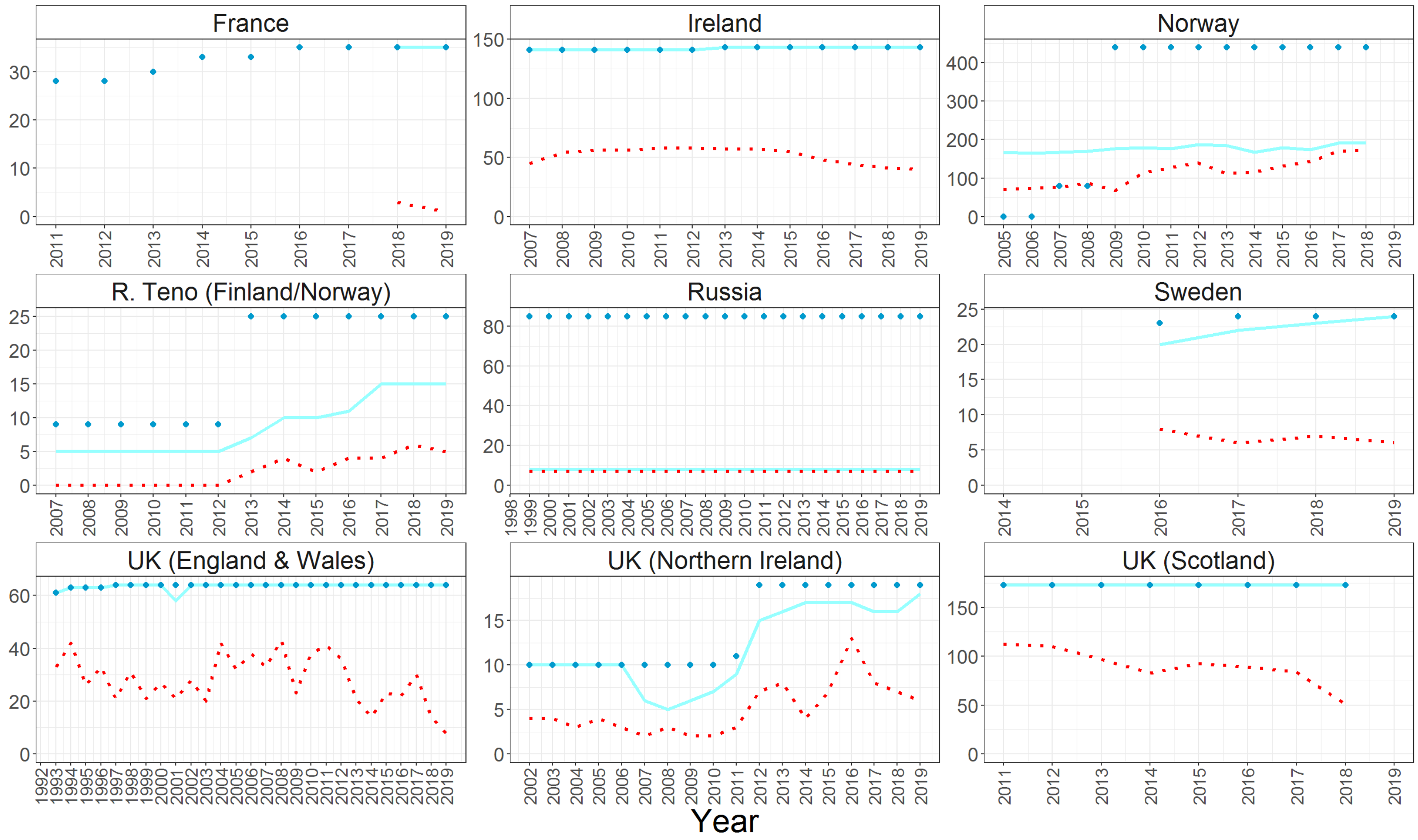


Figure 3.3.5.1 Time-series showing the number of rivers with established CLs (light blue dotted lines), the number of rivers assessed annually (light blue solid lines), and the number of rivers meeting CLs annually (red dotted lines) for jurisdictions in the NEAC area. (note: data prior to 2018 for France is currently under review).

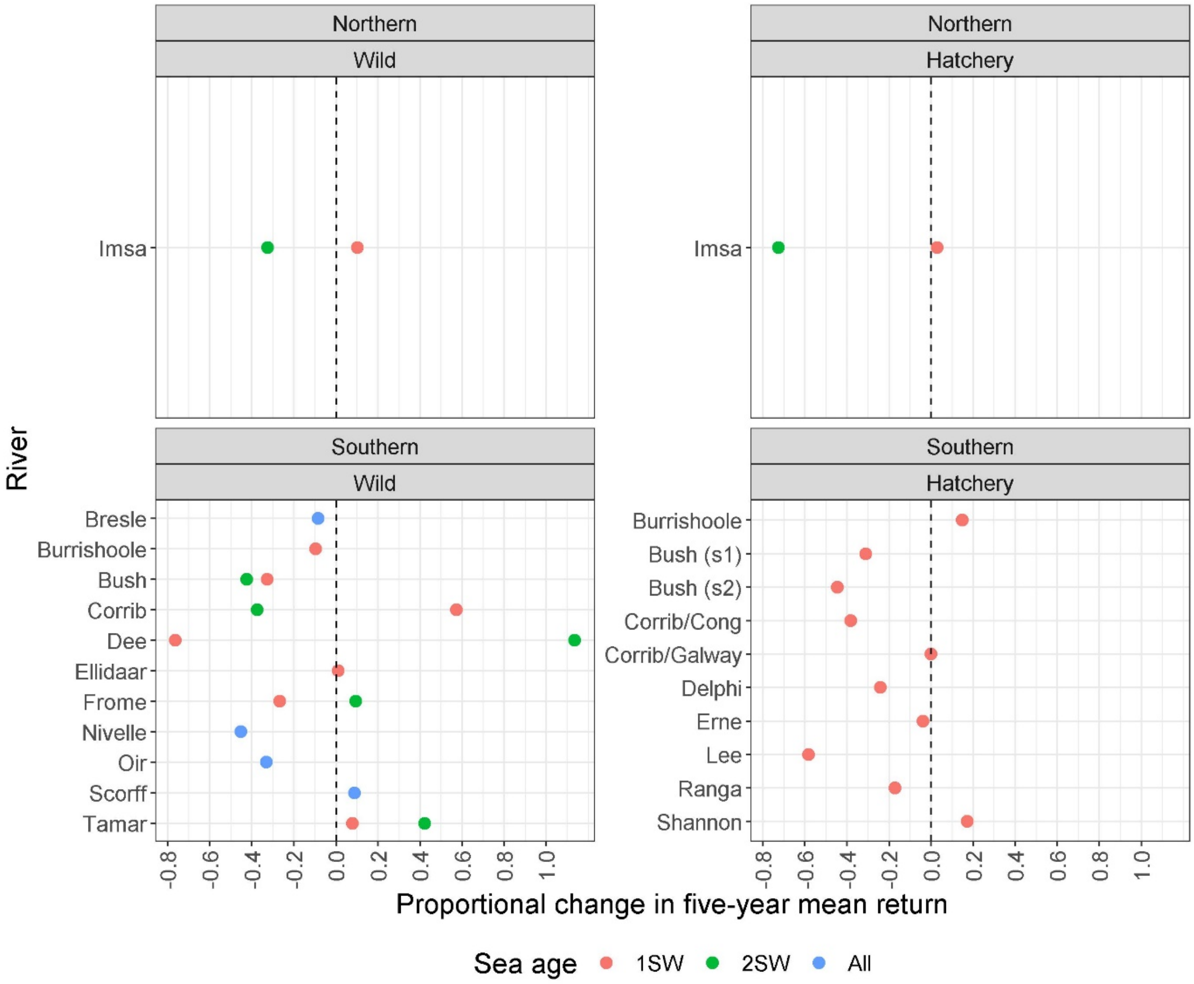


Figure 3.3.6.1. Comparison of the proportional change in the five-year mean returns for 1SW and 2SW wild (left hand panels) and hatchery (right hand panels) salmon smolts to rivers of Northern (upper panels) and Southern NEAC (lower panels) areas for the 2009 to 2013 and 2014 to 2018 smolt years (2008 to 2012 and 2013 to 2017 for 2SW salmon). Red circles indicate 1SW, green circles 2SW, and blue circles all sea-age returning adults. Populations with at least three data-points in each of the two time periods are included in the analysis. The scale of change in some rivers is influenced by low return numbers creating high uncertainty, which may have a large consequence on the proportional change.

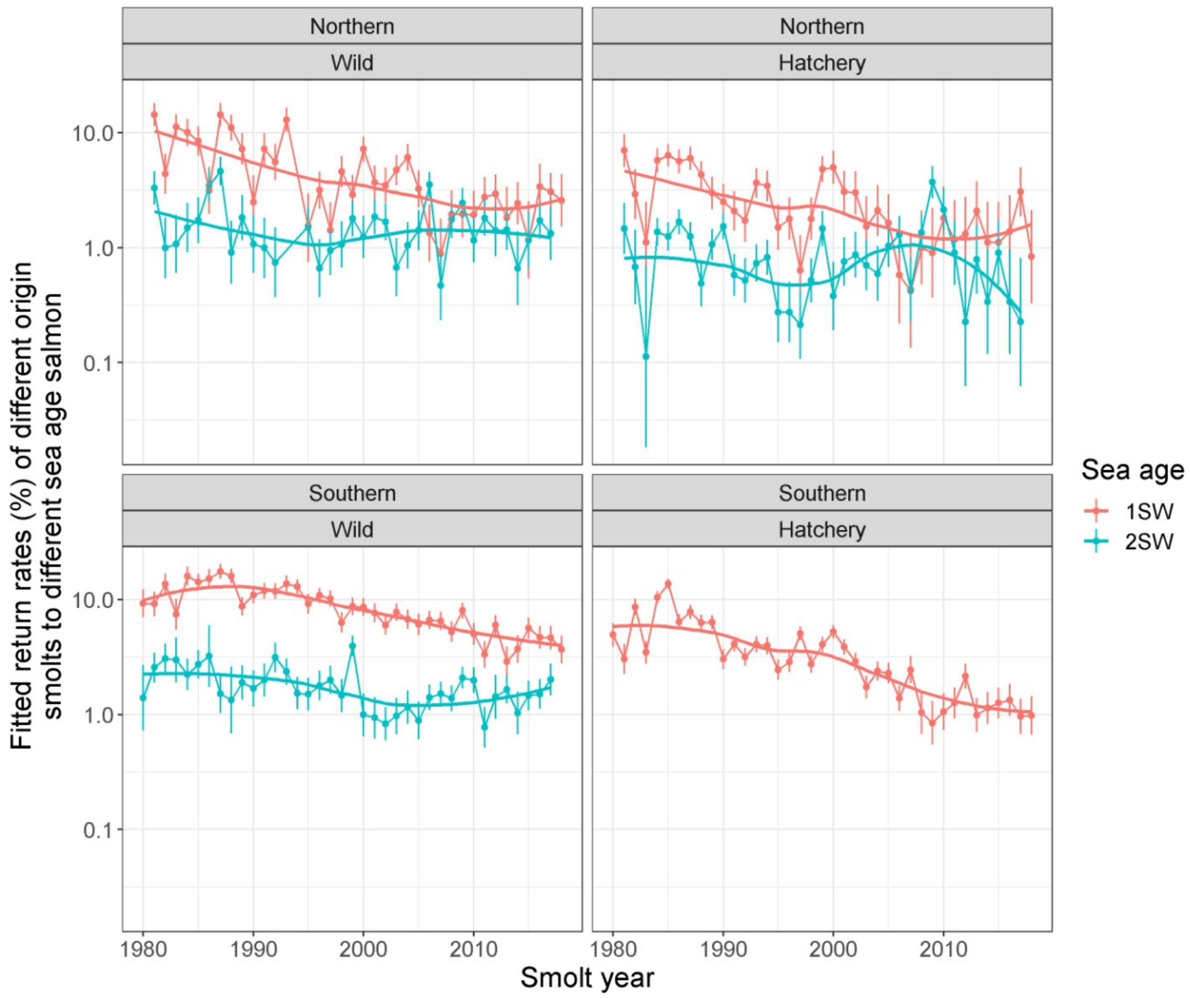


Figure 3.3.6.2. Least squared (marginal mean) average annual survival indices (%) of wild (left hand panels) and hatchery origin smolts (right hand panels) of 1SW (red) and 2SW (blue) salmon to Northern (top panels) and Southern NEAC areas (bottom panels). For most rivers in Southern NEAC, the values are returns to the coast prior to the homewater coastal fisheries. Annual means derived from a general linear model analysis of rivers in a region with a quasi-Poisson distribution (log-link function). Error bars represent standard errors. Note the *y*-axis scale is on a log scale and differs among panels, and there are no return rates in 1993 and 1994 for 2SW wild smolts in the Northern NEAC. Trend lines are from locally weighted polynomial regression (LOESS) and are meant to be a visual interpretation aid. Following details in Tables 3.3.6.1 and 3.3.6.2 the analyses included estimated survival (%) to 1SW and 2SW returns by smolt year.

4 North American Commission

4.1 NASCO has requested ICES to describe the key events of the 2019 fisheries

The previous advice provided by ICES (2018) indicated that there were no mixed-stock fishery catch options on the 1SW non-maturing salmon component for the 2018 to 2020 PFA years. The NASCO Framework of Indicators of North American stocks for 2020 did not indicate the need for a revised analysis of catch options and no new management advice for 2020 is provided. The assessment was updated to 2019 and the stock status is consistent with the previous years' assessments and catch advice.

4.1.1 Key events of the 2019 fisheries

There were no significant changes in the 2019 fisheries.

4.1.2 Gear and effort

Canada

The 23 areas for which Fisheries and Oceans Canada (DFO) manages the salmon fisheries are called Salmon Fishing Areas (SFAs). Inner Bay of Fundy Atlantic salmon, SFA 22 and part of SFA 23, have been federally listed as endangered under the Canadian Species at Risk Act and information for these stocks are not included in the information and advice provided to NASCO, as with the exception of one population, these stocks have a localized migration strategy while at sea and an incidence of maturity after one winter at sea. In Québec, the management of Atlantic salmon is delegated to the province (Ministère des Forêts, de la Faune, et des Parcs) and the fishing areas are designated by Q1 through Q11 (Figure 4.1.2.1). Harvests (fish which were retained) and catches (including harvests and fish caught and released in recreational fisheries) are categorized in two size groups: small and large. Small salmon, generally 1SW, in the recreational and subsistence fisheries refer to salmon less than 63 cm fork length. In historic commercial fisheries small salmon refer to fish less than 2.7 kg whole weight. Large salmon, generally MSW and repeat spawners, in recreational and subsistence fisheries are greater than or equal to 63 cm fork length. In historic commercial fisheries large salmon refer to fish greater than or equal to 2.7 kg whole weight.

Three groups exploited salmon in Canada in 2019: Indigenous, Labrador resident subsistence, and recreational fishers. There were no commercial salmon fisheries in Canada in 2019 and retaining bycatch of salmon in commercial fisheries targeting other species is not permitted. Salmon discards from these fisheries are not estimated, however, previous analyses by ICES indicated the extent was low (ICES, 2004). The sale of Atlantic salmon caught in any Canadian fishery is prohibited.

In 2019, four subsistence fisheries harvested salmon in Labrador: 1) Nunatsiavut Government (NG) members fishing in northern Labrador communities (Rigolet, Makkovik, Hopedale, Postville, and Nain); and in Lake Melville communities (Northwest River, Happy Valley – Goose Bay) 2) Innu Nation members fishing in the northern Labrador community of Natuashish and Lake Melville community of Sheshatshiu; 3) NunatuKavut Community Council (NCC) members fishing in southern Labrador and Lake Melville (Licences issued from the communities of Happy Valley – Goose Bay, Cartwright and Port Hope Simpson) and, 4) Labrador residents fishing in Lake Melville and northern and southern coastal communities. The NG, Innu, and NCC fisheries were jointly monitored by Indigenous Fishery Guardians/Conservation Officers and DFO. Nylon twine is only permitted in nets, monofilament nets are strictly prohibited. The maximum length of net permitted per household is 15–25 fathoms, depending on management area. Only nets with a minimum mesh size of 89 mm (3.5 inches) and a maximum of 102mm (4 inches) may be used in Upper Lake Melville and southern Labrador by the NCC. Nets are generally set in estuaries and coastal bays within headlands. Catch statistics are based on logbook reports.

Most catches (93% in 2019, Figure 2.1.1.2) in Canada now take place in rivers or in estuaries. Fisheries are principally managed on a river-by-river basis and in areas where retention of large salmon in recreational fisheries is allowed, the fisheries are closely controlled. In other areas, fisheries are managed on larger management units that encompass a collection of geographically neighbouring stocks. The commercial fisheries are now closed and the remaining coastal subsistence fisheries in Labrador are mainly located in bays generally inside the headlands. Sampling of the Labrador subsistence fisheries continued in 2019 for biological characteristics and tissue samples to identify the origin of harvested salmon.

The following management measures were in effect in 2019:

Indigenous food, social, and ceremonial (FSC) fisheries

In Québec, Indigenous fisheries took place subject to agreements, conventions or through permits issued to the communities. There are approximately ten communities with subsistence fisheries in addition to the fishing activities of the Inuit in Ungava (Q11), who fished in estuaries or within rivers. The permits generally stipulate gear, season, and catch limits. Catches with permits have to be reported collectively by each Indigenous group. However, catches under a convention, such as for Inuit in Ungava, do not have to be reported. When reports are not available, the catches are estimated based on the most reliable information available (i.e. local enforcement officer or biologist reports). In the Maritimes (SFAs 15 to 23), FSC agreements were signed with several Indigenous groups (mostly First Nations) in 2019. The signed agreements often included allocations of small and large salmon and the area of fishing was usually in-river or estuaries. Harvests that occurred both within and outside agreements were obtained directly from the Indigenous groups. In Labrador (SFAs 1 and 2), FSC agreements with the NG, Innu, and NCC resulted in fisheries in estuaries and coastal areas. By agreement with First Nations, there were no FSC fisheries for salmon in Newfoundland in 2019. Harvests by Indigenous recreational fishers were reported under the recreational harvest categories.

Labrador resident subsistence fisheries

DFO is responsible for regulating the Labrador resident fishery. In 2019, a licensed gillnet subsistence trout and charr fishery for Labrador residents took place in estuary and coastal areas of Labrador. A total of 262 licences were issued in 2019. Conditions restrict a seasonal bycatch of three salmon of any size while fishing for trout and charr; three salmon tags accompanied each licence. Resident fishers were required to remove their nets from the water once their bycatch of salmon was caught. Catches exceeding three salmon must be discarded. All licensed resident fishers were requested to complete and return logbooks to DFO.

Recreational fisheries

Licences are required to fish recreationally for Atlantic salmon in Canada. Gear is restricted to fly fishing and there are daily and seasonal bag limits. Recreational fisheries management in 2019 varied by area and large portions of the southern areas remained closed to all directed salmon fisheries (Figure 4.1.2.2).

Within the province of Québec, there are 114 salmon rivers. Fishing for salmon was prohibited on 33 rivers. Large salmon could be retained throughout the season on eight rivers (seven in the north and lower North shore, and one in the South) and for part of the season on eight other rivers, for a total of 16 rivers. Small salmon could be retained for the entire season on 56 rivers and nine rivers permitted catch and release only. Since 2018, a seasonal permit allows a total retention of four salmon for the season, of which only one could be a large salmon. The only exception is for the four rivers located in the Ungava Bay region, where anglers could retain four salmon of any size under the seasonal permit. A three-day permit allows for the retention of one salmon of any size. Under these permits, retention of large salmon is allowed only from rivers which are open to retention of large salmon. A catch and release permit allows fishing for catch and release only.

Mandatory catch and release measures for large salmon have been in effect since 1984 in the Maritime provinces of Canada (SFA 15 to 23). Following the very low returns to many Gulf rivers in 2014, mandatory catch and release measures for small salmon were implemented in the Gulf region (SFAs 15 to 18) in 2015 and have continued. High water temperatures in 2019 prompted some angling restrictions in the Miramichi River system during the season. In Scotia-Fundy (SFAs 19 to 23), only three rivers (located in eastern Cape Breton, SFA 19) were open to angling for Atlantic salmon, restricted to catch and release. For two of these rivers, the fishery was only open for October 1 to 31, and in the third river, the season opened June 1 to October 31 but was closed during July 15 to September 1.

In Newfoundland and Labrador, recreational retention and catch and release limits have undergone changes in recent years following on two poor years of salmon returns in 2016 and 2017. The previous retention limit of two, four or six small salmon depending on the river classification system (Veinott *et al.*, 2013) was reduced to one small salmon per season in 2018. In addition, the daily limit for catch and release angling was reduced from four salmon to three. The 2019 angling season opened with recreational retention limits of three salmon per angler (one on class two rivers, two on class four and six rivers) and a daily limit for catch and release angling of three salmon. In addition, the protocol for closing rivers to angling due to environmental conditions (high water temperatures and/or low water levels) changed for the 2019 angling season in Newfoundland and Labrador such that angling on rivers experiencing these conditions was restricted to morning hours only (until 10 AM).

In all areas of eastern Canada, there is no estimate of salmon released as bycatch in recreational fisheries targeting other species.

USA

There were no recreational or commercial fisheries for anadromous Atlantic salmon in the USA in 2019.

France (Islands of Saint Pierre and Miquelon)

Seven professional and 80 recreational gillnet licences were issued in 2019 (Table 4.1.2.1). Professional licences had a maximum authorisation of three nets of 360 metres maximum length each whereas recreational licences were restricted to one net of 180 metres. The selling of Atlantic salmon was only allowed by professional licence holders and was restricted to within the islands of Saint Pierre and Miquelon.

4.1.3 Catches in 2019

Canada

The provisional harvest of salmon in 2019 by all users is 93.8 t, approximately 19% higher than the finalized 2018 harvest of 78.5 t (Tables 2.1.1.1, 2.1.1.2; Figure 4.1.3.1). This is the second lowest catch in the time-series since 1960. The 2019 harvest comprised 27 387 small salmon (47.7 t) and

9588 large salmon (46.0 t), 26% more small salmon and 12% more large salmon by number compared to 2018. There has been a dramatic decline in harvest since 1988 as a result of the closure of commercial fisheries (year of closure: Newfoundland 1992, Labrador 1998, Québec 2000).

The Working Group recommends complete and timely reporting of catch statistics from all fisheries for all areas of eastern Canada.

Indigenous FSC fisheries

The provisional harvest by Indigenous groups in 2019 was 54.0 t, higher than the 52.5 t reported in 2018 (Table 4.1.3.1). The percentage of large salmon by number (50.3%) in 2019 increased from 44% in 2018.

In Labrador, total catch from Indigenous fishers was estimated by raising the reported catch from logbooks to the total number of fishers (74% reporting rate in 2019). For Québec, catches from the Indigenous fisheries were to be reported collectively by each Indigenous community. As in Québec, Indigenous groups with fishing agreements in the DFO Gulf and Maritimes regions were expected to report their catches. When reports were not available, the catches were estimated on the basis of the most reliable information available (i.e. local enforcement officer or biologist reports). The reliability of the catch estimates varies among user groups. Reports in most years were incomplete. The 2019 values will be updated when the reports are finalised.

Labrador resident subsistence fisheries

The estimated catch for the Labrador resident fisheries in 2019 was 1.6 t, similar to the harvest (by weight) reported for the previous three years. This represents approximately 535 fish, 47% large by number (Table 4.1.3.2).

Recreational fisheries

Harvest in recreational fisheries in 2019 totalled 20 240 small and large salmon (38.1 t). This harvest, by number, increased 58.9% from the 2018 harvest and decreased 31.6% from the previous five-year mean, and is the second lowest in the time-series since 1974 (Table 4.1.3.3; Figure 4.1.3.2). The small salmon harvest of 19 056 fish was 62% higher than the 2018 harveSt The large salmon harvest of 1184 fish was 21% above the 2018 harvest, and these were taken exclusively in Québec in both years. The small salmon size group has contributed 90% on average of the total recreational harvests since the imposition of catch and release measures for large salmon in recreational fisheries in the Maritimes (SFA 15 to 23) and Newfoundland (SFA 3 to 14B) in 1984 (retention of large salmon ceased in Labrador in 2011).

In 2019, 46 335 salmon (26 237 small and 20 098 large) were caught and released (Table 4.1.3.4; Figure 4.1.3.3), representing 70% of the total catch (including retained fish), the second highest value of the time-series and has consistently been above 50% since 1997. For large salmon, 94% of the catch was released (retention permitted only in Québec), which was the third highest value in the time-series (since 1984 closures in Maritimes and Newfoundland).

Recreational catch statistics for Atlantic salmon are not collected regularly in all areas of Canada and there is no enforceable mechanism in place that requires anglers to report their catch statistics, except in Québec where reporting of harvested salmon is an enforced legal requirement. The last recreational angler survey for New Brunswick was conducted in 1997, and the catch rates for the Miramichi River from that survey have been used to estimate catches (both harvest and catch and release) for all subsequent years.

Commercial fisheries

All commercial fisheries for Atlantic salmon remained closed in Canada in 2019 and the catch therefore was zero.

Unreported catches

The unreported catch for Canada totalled 11.6 t in 2019. However, this estimate is incomplete and will be updated when the data become available. The majority of this unreported catch is illegal fisheries directed at salmon (Tables 2.1.3.1, 2.1.3.2).

USA

There are no commercial or recreational fisheries for anadromous Atlantic salmon in the USA and the catch therefore was zero. Unreported catches in the USA were estimated to be 0 t.

France (Islands of Saint Pierre and Miquelon)

A total harvest of 1.28 t (506 fish sizes combined) was reported for Saint Pierre and Miquelon in 2019, similar to 2018 (Tables 2.1.1.1, 4.1.2.1) and the fourth lowest catch in the time-series since 1990.

There are no unreported catch estimates for the time-series.

4.1.4 Harvest of North American salmon, expressed as 2SW salmon equivalents

Harvest histories (1972 to 2019) of salmon, expressed as 2SW salmon equivalents in the 2SW return year are provided in Table 4.1.4.1. The Newfoundland and Labrador commercial fishery was historically a mixed-stock fishery and harvested both maturing and non-maturing 1SW salmon as well as 2SW maturing salmon. The harvest of repeat spawners and older sea ages was not considered in the run–reconstructions.

Harvests of 1SW non-maturing salmon in Newfoundland and Labrador commercial fisheries have been adjusted by natural mortalities of 3% per month for 13 months, and 2SW harvests in these same fisheries have been adjusted by one month to express all harvests as 2SW equivalents in the year and time they would reach rivers of origin. The Labrador commercial fishery has been closed since 1998. Harvests from the Indigenous Peoples' fisheries in Labrador (since 1998) and the residents' food fishery in Labrador (since 2000) are both included. Mortalities in mixed-stock fisheries and losses in terminal locations (including harvests, losses from catch and release mortality and other removals including brood stock) in Canada were summed with those of the USA to estimate total 2SW equivalent losses in North America. The terminal fisheries included coastal, estuarine and river catches of all areas, except Newfoundland and Labrador where only river catches were included, and excluding Saint Pierre and Miquelon. Data inputs were updated to 2019.

Total 2SW harvest equivalents of North American origin salmon in all fisheries peaked at 526 700 fish in 1974 and was above 200 000 fish in most years until 1990 (Table 4.1.4.1; Figure 4.1.4.1). Harvest equivalents within North America peaked at about 363 000 in 1976 and have remained below 12 000 2SW salmon equivalents for most years between 1999 and 2019 (Table 4.1.4.1; Figure 4.1.4.1). The percentage of the 2SW harvest equivalents taken in North America has varied from 46% to 65% of the total removals in all fisheries during 2007 to 2019 (Figure 4.1.4.1).

In the most recent 2SW harvest year (2019), the losses of 2SW salmon in terminal areas of North America was estimated at 3600 fish (median), 41% of the total North American catch of 2SW salmon. The percentages of harvests occurring in terminal fisheries ranged from 17 to 33% during 1972 to 1991 and 41 to 87% during 1992 to 2019 (Table 4.1.4.1). Percentages increased significantly since 1992 with the reduction and closures of the Newfoundland and Labrador commercial mixed-stock fisheries. The percentage of 2SW salmon harvested in North American fisheries in 2019 is 48% (Table 4.1.4.1). The percentages of the 2SW harvests by fishery and fishing area are summarized in Figure 4.1.4.1. The percentage of the 2SW harvest equivalents taken at Greenland was as high as 56% in 1992 and 2002 and as low as 5% in 1994 when the internal use fishery at

Greenland was suspended (Figure 4.1.4.1). In the last three years, the Greenland share of the 2SW harvest equivalents has been 36% to 52%. For similar years, the harvests in the Labrador subsistence fisheries have been 27 to 34% of the total harvests and 17% to 24% in terminal fisheries of Québec (Figure 4.1.4.1).

4.1.5 Origin and composition of catches

In the past, salmon from both Canada and the USA were taken in the commercial fisheries of eastern Canada. Sampling programs of current marine fisheries (Labrador; Saint Pierre and Miquelon) are used to determine region of origin of harvested salmon.

Labrador subsistence fisheries sampling program

Salmon harvested in the Labrador subsistence fisheries (SFAs 1 and 2, Figure 4.1.2.1) were sampled opportunistically for length, weight, sex, scales (for age analysis) and tissue (genetic analysis). Fish were also examined for the presence of external tags or marks.

In 2019, a total of 866 samples (7% of harvest by number) were collected from the Labrador subsistence fisheries: 72 from northern Labrador (SFA 1A), 271 from Lake Melville (SFA 1B), and 523 from southern Labrador (SFA 2). Not all scales can be interpreted for sea age and/or river age. Based on the interpretation of the scale samples (n=831), percentage sea age composition was 70% 1SW, 25% 2SW, 0% 3SW and 5% previously spawned salmon. All of the salmon samples interpreted for river age (n=823) were 2 to 6 years (modal age 4, 60%). There were no river age 1 and few river age 2 (n=2) salmon sampled, suggesting, as in previous years (2006 to 2018), that very few salmon from the most southern stocks of North America (USA, Scotia-Fundy) were exploited in these fisheries.

Labrador: Sample summary 2019								
Area	Number of Scale Samples	River Age (percentage of samples)						
		1	2	3	4	5	6	7
Northern Labrador (SFA 1A)	69	0.0	0.0	14.5	69.6	15.9	0.0	0.0
Lake Melville (SFA 1B)	242	0.0	0.4	9.1	66.1	23.1	1.2	0.0
Southern Labrador (SFA 2)	512	0.0	0.2	10.2	55.9	33.0	0.8	0.0
All areas	823	0.0	0.2	10.2	60.0	28.7	0.9	0.0

In 2019, a total of 485 of 847 tissue samples from the Labrador subsistence salmon fisheries were analysed using the SNP panel with 31 range-wide reporting groups (Table 4.1.5.1; Figures 4.1.5.1, 4.1.5.2, 4.1.5.3). The estimated percent contributions (and associated 95% credible interval) to each reporting group in 2019 are shown in Table 4.1.5.2 and summarized in Figure 4.1.5.4. As in previous years, the estimated origin of the samples was dominated (>98%) by the Labrador reporting groups. The dominance of the Labrador reporting groups is consistent with previous analyses conducted for the period 2006–2018 which estimated >95.0% of the harvest was attributable to Labrador stocks (ICES, 2019). Furthermore, assignment of harvest within the three Labrador genetic reporting groups suggest largely local harvest within salmon fishing areas.

The percentage of the small salmon and large salmon catch which was sampled and analysed for stock origin was approximately 3% to 4% by size group in 2018 and 2019, indicating that the size groups are equally represented in the analysed samples. The percentage of the catch which is processed for stock origin (3.8%), is less than the percentage of the catch sampled (7% by number) due to resource constraints, however, emphasis was placed on genotyping samples from the coastal areas (SFA 1A, 2) where interception of non-local stocks has been more prevalent in the past.

Labrador Subsistence fishery sampling			
Size group	Statistics	2018	2019
Small salmon	Samples	325	329
	Catch	8780	7050
	% of catch	3.7%	4.7%
Large salmon	Samples	153	146
	Catch	4077	5808
	% of catch	3.8%	2.5%
Small and large salmon	Samples	499	485
	Catch	12 858	12 858
	% of catch	3.9%	3.8%

Saint Pierre and Miquelon fisheries sampling programme

Sixty-four samples (13% of reported harvest by number of 506 fish) were collected from the Saint Pierre and Miquelon salmon fishery between 31 May and 2 July 2019. Based on the interpretation of the scale samples, percentage sea-age composition was 72% 1SW and 28% 2SW, with no previously spawned salmon. River ages ranged from two to five years (modal age 2).

Saint Pierre and Miquelon: Sample summary 2019									
Size group	Number of Samples	Virgin Sea Age (%)		River Age (%)					
		1SW	2SW	1	2	3	4	5	6
Small salmon (<63 cm)	45	100.0	0.0	0.0	43.2	36.4	18.2	2.2	0.0
Large salmon (≥63 cm)	19	5.3	94.7	0.0	66.7	27.8	5.5	0.0	0.0
All	64	71.9	28.1	0.0	50.0	33.9	14.5	1.6	0.0

A total of 63 samples collected in 2019 from the Saint Pierre and Miquelon fisheries were analysed using the SNP panel and range wide baseline (Figures 4.1.5.1 and 4.1.5.2). The estimated percent contributions to the reporting groups (and associated 95% credible interval) are shown in Table 4.1.5.3, and summarized in Figure 4.1.5.5. The percent contributions were refined to include only those reporting groups that were supported by the assignment of individuals to that reporting group with 80% likelihood or higher. In contrast to the last few years, a lower contribution of the catch is represented by Newfoundland reporting groups (24% compared to

>60% in 2017 and 2018). The Gulf of St Lawrence (42%) and Gaspe Peninsula (30%) make up the other major contributions in 2019, however at a larger relative contribution than seen recently.

The proportion of the samples in 2019 that were small salmon was 0.70 (Figure 4.1.5.6), compared to 0.92 small salmon in 2018 and 0.93 small salmon in 2017 (ICES, 2019). As in previous years, there was no information on how the samples were collected in 2019 or if they were representative of the total catch. ICES (2018) reported on a consistent increase in the proportion of the samples assigned to the Newfoundland regional groups with increasing proportions of small salmon in the samples from the fishery further emphasizing the importance of having representative sampling of the fishery catches in order to assess the impacts of this mixed-stock fishery on stocks in NAC.

Recommendations for future activities

The Working Group recommends improved catch statistics and sampling of the Labrador and the Saint Pierre and Miquelon fisheries. Improved catch statistics and sampling of all aspects of the fisheries across the fishing season will improve the information on biological characteristics and stock origin of salmon harvested in these mixed-stock fisheries.

4.1.6 Exploitation rates

Canada

Provisional mean exploitation rates in the 2019 recreational fishery for retained small salmon were 11.3% for Newfoundland (nine rivers; range of 3 to 25%) and 2.7% for Labrador (Sand Hill River only), an increase of 9% and a decrease of 1% from the previous five year mean for Newfoundland and Labrador, respectively. In Québec, total fishing exploitation rate was estimated at 14%, with rates of 7% for the Indigenous fishery and 8% for the recreational fishery. The recreational exploitation rate for large salmon in Québec was 4%, among the lowest value since 1984; it is mostly influenced by the increase in the number of released fish in recent years due to regulatory changes. Retention of small and large salmon in the recreational fisheries of Nova Scotia, New Brunswick and Prince Edward Island was not permitted in 2019.

USA

There was no exploitation of anadromous salmon in homewaters.

Exploitation trends for North American salmon fisheries

Annual exploitation rates of small salmon (mostly 1SW) and large salmon (mostly MSW) in North America for the 1971 to 2019 time period were calculated by dividing annual estimated losses (harvests, estimated mortality from catch and release (ICES, 2010), brood stock removals) in all areas of North America by annual estimates of the returns to North America prior to any homewater fisheries. The fisheries included coastal, estuarine and river fisheries in all areas, as well as the commercial fisheries of Newfoundland and Labrador, which harvested salmon from all regions in North America.

Exploitation rates of both small and large salmon fluctuated annually but remained relatively steady until 1984 when exploitation of large salmon declined sharply with the introduction of the non-retention of large salmon in angling fisheries and reductions in commercial fisheries (Figure 4.1.6.1). Exploitation of small salmon declined steeply in North America with the closure of the Newfoundland commercial fishery in 1992. Declines continued in the 1990s with continuing management controls in all fisheries to reduce exploitation. In the last ten years, exploitation rates on small salmon and large salmon have remained at the lowest in the time-series, averaging 10% for large salmon and 13% for small salmon. However, exploitation rates across regions within North America are highly variable.

4.2 Management objectives and reference points

Management objectives are described in Section 1.4 and reference points and the application of precaution are described in Section 1.5.

Fisheries and Oceans Canada (DFO) undertook a revision of reference points for Atlantic salmon in Canada that conform to the Precautionary Approach (ICES, 2016). The Limit Reference Points in all cases are defined in terms of total eggs from all sizes and sea ages of salmon. DFO Newfoundland Region retained the current conservation requirement based on 240 eggs per 100 m^2 of fluvial rearing habitat, and in addition for insular Newfoundland 368 eggs per ha of lacustrine habitat (or 150 eggs per ha for stocks on the northern peninsula of Newfoundland), as equivalent to their Limit Reference Point and have defined the Upper Stock Reference as 150% of the Limit Reference Point (DFO, 2017). DFO Maritimes Region (Scotia-Fundy) has retained the current conservation requirement based on 240 eggs per 100 m^2 as the Limit Reference Point (DFO, 2012; Gibson and Claytor, 2013). DFO Gulf Region revised and defined the Limit Reference Point in that region of Canada using the proportion of eggs from MSW salmon as a covariate in the Bayesian Hierarchical Model (DFO, 2018). The Province of Québec revised the Limit Reference point and Upper Stock Reference point using a Bayesian hierarchical analysis of stock–recruitment data (Dionne *et al*., 2015; MFFP, 2016; ICES, 2017). For Québec, the management plan for recreational fishery provides river-specific upper reference points, expressed in number of eggs, to regulate large salmon retention (MFFP, 2016).

As changes were made to the reference points used to manage harvests of large salmon in DFO Gulf Region and Québec, the 2SW salmon Conservation Limits (CLs) were also revised (ICES, 2019). Revised CLs for 2SW salmon for Canada total 114 295 (previous value 123 349) for a combined revised total for North America of 143 494 2SW salmon (previous value 152 548). No other changes to the 2SW CLs or the Management Objectives were made from those identified previously (ICES, 2015).

Country and Commission Area	Stock Area	2SW spawner requirement number of fish (previous)	2SW Management Objective (number of fish)
Canada	Labrador (LAB)	34 746	
Canada	Newfoundland (NFLD)	4022	
Canada	Québec (QC)	32 085	
Canada	Southern Gulf of St Lawrence (GULF)	18 737	
Canada	Scotia-Fundy (SF)	24 705	10 976
Canada Total		114 295	
USA		29 199	4549
North America Total		143 494	

4.3 Status of stocks

Based on information provided in the update (2018) of the NASCO Database of Salmon Rivers, a total of 857 rivers have been identified in eastern Canada. There are 21 rivers in eastern USA where salmon are or were present within the last half century. Conservation requirements have been defined for 498 (58%) of these rivers in eastern Canada and all rivers in USA. Assessments of adult spawners and egg depositions relative to conservation requirements were reported for 86 rivers in eastern North America in 2019.

4.3.1 Smolt abundance

Canada

Wild smolt production was estimated in 11 rivers in 2019 (Table 4.3.1.1). In 2019, the relative smolt production, standardized to the size of the river using the CL egg requirements, was highest in Campbellton River (Newfoundland) and lowest in Rocky River (Newfoundland) (Figure 4.3.1.1). Trends in smolt production over the time-series declined ($p < 0.05$) in the Nashwaak River (Scotia-Fundy, 1998–2019), Restigouche River (Gulf, 2002–2019), the two monitored rivers of Québec (St Jean, 1989–2019; de la Trinite, 1984–2019) and the Conne River (Newfoundland, 1987–2019), whereas production significantly increased ($p < 0.05$) in Western Arm Brook (Newfoundland, 1971–2019). No other rivers showed statistically significant long-term trends (Figure 4.3.1.1).

USA

In 2019, wild salmon relative smolt production was estimated on the Sheepscot River and the Narraguagus River (Table 4.3.1.1; Figure 4.3.1.1). Smolt production has declined over time ($p < 0.05$) in both Sheepscot River (2009–2019) and Narraguagus River (1997–2019).

4.3.2 Estimates of total adult abundance

Returns of small (1SW), large (MSW), and 2SW salmon (a subset of large) to each region were originally estimated by the methods and variables developed by Rago *et al*. (1993) and reported by ICES (1993). Further details are provided in the Stock Annex (Annex 6). The returns for individual river systems and management areas for both sea age groups were derived from a variety of methods. These methods included counts of salmon at monitoring facilities, population estimates from mark–recapture studies, and applying angling and commercial catch statistics, angling exploitation rates, and measurements of freshwater habitat. The 2SW component of the large returns was determined using the sea age composition of one or more indicator stocks.

Returns are the number of salmon that returned to the geographic region, including fish caught by homewater commercial fisheries, except in the case of the Newfoundland and Labrador regions where returns do not include landings in mixed stock commercial and food fisheries. This avoided double counting fish because commercial catches in Newfoundland and Labrador and food fisheries in Labrador were added to the sum of regional returns to create the pre-fishery abundance estimates (PFA) of North American salmon.

Total returns of salmon to USA rivers are the sum of trap catches and redd-based estimates.

Data from previous years were updated and corrections were made to data inputs when required (e.g. 2017 data were revised, 2018 data were finalised and 2019 data are considered to be preliminary).

Since 2002, Labrador regional estimates are generated from data collected at four counting facilities, one in SFA 1 and three in SFA 2 (Figures 4.1.2.1, 4.3.2.1). The current method to estimate

Labrador returns assumes that the total returns to the northern area are represented by returns at the single monitoring facility in SFA 1 and returns in the southerly areas (SFA 2 and 14b) are represented by returns at the three monitoring facilities in SFA 2. The production area (km^2) in SFA 1 is approximately equal to the combined production areas in SFA 2 and 14b. The uncertainty in the estimates of returns and spawners has been relatively high compared with other regions in recent years (approximate coefficient of variation of 12–26% since 2002).

The Working Group recommends that additional monitoring be considered in Labrador to estimate stock status for that region. Additionally, efforts should be undertaken to evaluate the utility of other available data sources (e.g. Indigenous and recreational catches and effort) to describe stock status in Labrador.

Estimates of small, large and 2SW salmon returns to the six geographic areas and overall for NAC are reported in Tables 4.3.2.1 to 4.3.2.3 and are shown in Figures 4.3.2.2 to 4.3.2.4.

Small salmon returns

- The total estimate of small salmon returns to North America in 2019 (332 100) was 22% lower than the revised estimated returns in 2018 (425 200), and the 2019 estimate ranks eighth lowest of the 49-year time-series.
- Small salmon returns decreased markedly (-59%) in 2019 from the previous year in Labrador but were much higher in Newfoundland and Scotia-Fundy (81% and 189%, respectively).
- Small salmon returns in 2019 were among the lowest (third to sixth lowest of 49 years) for Québec, Gulf, and Scotia-Fundy.
- Small salmon returns to Labrador (117 500) and Newfoundland (171 400) combined represented 87% of the total small salmon returns to North America in 2019.

Increased estimated abundance of small salmon in Newfoundland over the time-series is not reflected in all areas of Newfoundland (Figure 4.3.2.5). Estimated abundance has increased in the salmon fishing areas of the northeast coast of Newfoundland (SFA 3–5) and in the western portion of the island (SFA 13 and 14A) while estimated abundances have strongly declined on the south coast (SFA 10–12) and the eastern portion of the island (SFA 6–9), reflecting important differences in status of salmon stocks in the Newfoundland region. Changes in the recreational fisheries management measures in recent years have resulted in lower catches in this fishery and as a result increasing uncertainty in the Salmon Fishing Area specific estimates of abundance.

Mean percentage of total estimated return of small salmon to Newfoundland				
Time-period	SFA 13–14A	SFA 3–5	SFA 6–9	SFA 10–12
1971–1979	38%	33%	7%	22%
1980–1989	31%	40%	7%	22%
1990–1999	34%	43%	5%	17%
2000–2009	43%	44%	2%	11%
2010–2019	38%	51%	3%	9%

Large salmon returns

- The total estimated large salmon return to North America in 2019 of 103 900 fish was 15% lower than the revised estimate for 2018 (121 900), and the third lowest of the 49-year time-series beginning in 1971.
- Large salmon returns in 2019 decreased from the previous year in Labrador (41%), Gulf (43%) and Scotia-Fundy (52%), but increased in Québec (9%), Newfoundland (136%) and USA (109%).
- Large salmon returns in 2019 were the second lowest of the 49-year time-series for Gulf and Scotia-Fundy and the fourth lowest for Québec. Large salmon returns to Labrador (27 100) in 2019 were the tenth highest of the 49-year time-series, but the second lowest of the last ten years.
- Large salmon returns to Labrador (27 100), Québec (31 000), and Gulf (19 700) combined represented 75% of the total large salmon returns to North America in 2019.

2SW salmon returns

- The total estimate of 2SW salmon returns to North America in 2019 (59 900) was 28% lower than the revised estimate for 2018 (82 900).
- 2SW salmon returns decreased from the previous year in Labrador (41%), Gulf (48%) and Scotia-Fundy (51%) and increased in Newfoundland (86%), Québec (9%) and USA (109%).
- 2SW salmon returns to NAC in 2019 were the second lowest on record (49 years), and were particularly low in Québec (fourth lowest), Gulf and Scotia-Fundy (second lowest). Although the estimated 2SW returns in Labrador were thirteenth highest in the 49-year time-series, the returns were the second lowest of the most recent ten years.
- 2SW salmon returns to Labrador (17 600), Québec (22 600), and Gulf (14 800) combined represented 92% of the total estimated 2SW salmon returns to North America in 2019. There are few 2SW salmon returns to Newfoundland (3000 in 2019), as the majority of the large salmon returns to that region are comprised of previously spawned 1SW salmon.

Estimated returns of small salmon and large salmon, and correspondingly 2SW, for Québec in 2018 are likely underestimated. As a result of low water conditions, adult returns in 2018 in a number of rivers did not occur until after the spawner surveys had been conducted in the early autumn when conditions are generally favourable for visual surveys. No correction for this was provided in the data used in the run–reconstruction and realized returns to Québec in 2018 are expected have been better than presented here.

4.3.3 Estimates of spawning escapements

Updated estimates for small, large and 2SW salmon spawners (1971 to 2019) were derived for the six geographic regions (Tables 4.3.3.1 to 4.3.3.3). A comparison between the numbers of returns and spawners for small and large salmon is presented in Figures 4.3.2.2 and 4.3.2.3. A comparison between the numbers of 2SW returns, spawners, CLs, and management objectives (Scotia-Fundy and USA) is presented in Figure 4.3.2.4.

Small salmon spawners

- The total estimate of small salmon spawners in 2019 for North America (309 000) was 24% below the revised estimate for 2018, and the 2019 estimate ranks thirty-fourth (descending rank) of the 49-year time-series.
- Estimates of small salmon spawners decreased in 2019 from the previous year in Labrador and Québec while they increased in Newfoundland, Scotia-Fundy, and USA.

- Small salmon spawners in 2019 were the fourth lowest on record for Gulf (18 700), and the fifth lowest on record for Scotia-Fundy (3500).
- Small salmon spawners for Labrador (116 100) and Newfoundland (154 400) combined represented 88% of the total small salmon spawners estimated for North America in 2019.

Large salmon spawners

- The total estimate of large salmon spawners in North America for 2019 (98 600) is 15% below the revised value for 2018 (116 600).
- Estimates of large salmon spawners decreased from 2018 in Labrador, Gulf and Scotia-Fundy and increased in Newfoundland, Québec and USA.
- Large salmon spawners in 2019 were the among the lowest of the time-series for Québec (ranked 37 of 49 in descending order), the fourth lowest for Gulf and the lowest of the time-series for Scotia-Fundy.
- Although large salmon spawners to Labrador in 2019 were the tenth highest of the 49-year time-series, they were the lowest of the most recent ten years.

2SW salmon spawners

- The total estimate of 2SW salmon spawners in North America for 2019 (56 400) decreased by 29% from the revised estimate for 2018 (79 400), and was lower than the combined 2SW CL for NAC (143 494).
- Estimates of 2SW salmon spawners decreased from the previous year in Labrador (41%), Gulf (49%) and Scotia-Fundy (52%) and increased in Newfoundland (89%), Québec (10%), and USA (39%).
- 2SW salmon spawners to NAC in 2019 were the sixth lowest on record (1971–2019; 49 years), and were particularly low in Scotia-Fundy (third lowest) and Gulf (sixth lowest). Although the estimated 2SW returns in Labrador were the twelfth highest in the 49-year time-series, the spawners were the second lowest of the most recent ten years.
- Estimates (median) of 2SW salmon spawners were below the region specific 2SW CLs in all six geographic areas in 2019, ranging from 3% in the USA to 77% in Gulf of the region-specific 2SW CLs. The estimated 2SW spawners in Labrador exceeded the 2SW CL every year during 2013 to 2017. The 2SW CLs were last exceeded in 2015 for Newfoundland and in 1982 for Québec. The 2SW CLs have never been exceeded for Scotia-Fundy and USA over the entire time-series.
- The 2SW management objectives for Scotia-Fundy (10 976) and USA (4549) were not met in 2019 and have not been met since 1991 (Scotia-Fundy), and 1990 (USA). For USA, 2SW returns are assessed relative to the management objective as adult stocking programmes for restoration efforts contribute to the number of spawners.

4.3.4 Egg depositions in 2019

Egg depositions by all sea ages combined in 2019 exceeded or equalled the river-specific CLs in 42 of the 86 assessed rivers (49%) and were less than 50% of CLs in 28 rivers (33%) (Figure 4.3.4.1). Large deficiencies in egg depositions (≤10% CLs) were noted in 17 assessed rivers (20%).

- CLs were met or exceeded in two of four (50%) assessed rivers in Labrador, ten of 20 rivers (50%) in Newfoundland, 28 of 35 rivers (80%) in Québec, and two of six rivers (33%) in Gulf.
- None of the seven assessed rivers in Scotia-Fundy met CLs and, with the exception of Middle River and North River, all were below 50% of CLs. Large deficiencies in egg depositions were noted in the Southern Upland (SFA 21) and Outer Bay of Fundy (SFA 23) regions of Scotia-Fundy where assessed rivers were at 5% or less of CLs.

- Large deficiencies in egg depositions were noted in the USA. All fourteen rivers for which proportion of their CLs was assessed were below 20%. All anadromous Atlantic salmon fisheries in the USA are closed.

The time-series of attained CLs for assessed rivers is presented in Table 4.3.4.1 and Figure 4.3.4.2. The time-series includes all assessed small rivers on Prince Edward Island (SFA 17) individually and an additional three partially assessed rivers in the USA.

- In Canada, CLs were first established in 1991 for 74 rivers. Since then the number of rivers with defined CLs increased to 266 in 1997 and to 498 since 2018. The number of rivers assessed annually has ranged from 61 to 91 and the annual percentages of these rivers achieving CL has ranged from 26% to 67% (58% in 2019) with no temporal trend.
- Conservation limits have been established for 33 river stocks in the USA since 1995. Sixteen of these are assessed against CL attainment annually with none meeting CLs to date. The proportion of the conservation requirement attained is only presented in Figure 4.3.4.1 for the fourteen rivers with the most precise adult abundance estimates.

4.3.5 Marine survival (return rates)

In 2019, return rate estimates were available from six wild and two hatchery populations from rivers distributed among Newfoundland, Québec, Scotia-Fundy, and USA (Tables 4.3.5.1 to 4.3.5.4). Due to issues in smolt abundance estimation in the recent years, returns rates in Scotia-Fundy region could not be calculated.

In 2019, the return rate to small salmon of hatchery-origin to the Penobscot River (USA) was 0.05%, similar to 2018 and the time-series mean (1991 to present). The return rate of hatchery-origin small salmon to the Saint John River (Scotia-Fundy, SFA 23) decreased from 0.25% in 2018 to 0.15% in 2019 (Table 4.3.5.3; Figure 4.3.5.2). Hatchery-origin 2SW return rates in 2019 were the same as in 2018 for the Saint John (Scotia-Fundy) and were the lowest recorded on that river (0.0%) (Table 4.3.5.4; Figure 4.3.5.2). On the Penobscot River the hatchery-origin 2SW return rate increased from 0.08% in 2018 to 0.13% in 2019 (Table 4.3.5.4; Figure 4.3.5.2).

Regional least squared (or marginal mean) mean annual return rates were calculated to balance for variation in the annual number of contributing experimental groups through application of a GLM (generalised linear model) with survival related to smolt year and river with a quasi-Poisson distribution (log-link function) (Figures 4.3.5.1 and 4.3.5.2). The time-series of regional return rates of wild and hatchery smolts to small salmon and 2SW adults by area for the period of 1970 to 2019 (Tables 4.3.5.1 to 4.3.5.4; Figures 4.3.5.1 and 4.3.5.2) were analysed using GLMs for each region and indicate the following:

- Return rates of wild smolts exceed those of hatchery released smolts;
- Small salmon return rates for Newfoundland populations in 2019 were greater than those for other populations in eastern North America;
- Small wild salmon return rates to rivers in Newfoundland have increased over the period 1970 to 2019 (1SW, $p < 0.05$);
- Small salmon (1SW) return rates of wild smolts for Québec vary annually and have declined over the period 1983/1984 to 2018/2019 (1SW, $p < 0.05$). Large salmon return rates of wild smolts in this region vary annually without a statistically significant trend;
- Small salmon and 2SW return rates of wild smolts to the Scotia-Fundy vary annually and without a statistically significant trend over the period mid-1990s to 2016. However, individual river trends for Scotia-Fundy may vary from the overall trend (e.g. declines in return rates to Southern Upland index rivers; DFO, 2013) and no return rates were available in the last two years;

- In Scotia-Fundy and USA, hatchery-origin smolt return rates to 2SW salmon have decreased over the period 1970 to 2019 (2SW, $p < 0.05$). 1SW return rates for Scotia-Fundy hatchery stocks have also declined for the period, while they have remained low without any statistically significant trend for USA.

4.3.6 Pre-fisheries abundance (PFA)

4.3.6.1 North American run–reconstruction model

The run–reconstruction model developed by Rago *et al*. (1993) and described in previous Working Group reports (ICES, 2008; 2009) and in the primary literature (Chaput *et al*., 2005) was used to estimate returns and spawners by size (small salmon, large salmon) and sea age group (2SW salmon) to the six geographic regions of NAC. The input data were similar in structure to the data used previously by the Working Group (ICES, 2012; Stock Annex). Estimates of returns and spawners to regions were provided for the time-series to 2019. The full set of data inputs are included in the Stock Annex and the summary output tables of returns and spawners by sea age or size group are provided in Tables 4.3.2.1 to 4.3.2.3 and 4.3.3.1 to 4.3.3.3.

4.3.6.2 Non-maturing 1SW salmon

The non-maturing component of 1SW salmon, destined to be 2SW returns (excluding 3SW and previous spawners) is represented by the PFA estimate for year i designated as PFANAC1SW. This annual PFA is the estimated number of salmon in the North Atlantic on 1 August of the second summer at sea. As the PFA estimates for potential 2SW salmon requires estimates of returns to rivers, the most recent year for which an estimate of PFA is available is 2018. This is because PFA estimates for 2019 require 2SW returns to rivers in North America in 2020.

The PFA estimates accounting for returns to rivers, fisheries at sea in North America, fisheries at West Greenland, and corrected for natural mortality are shown in Figure 4.3.6.1 and Table 4.3.6.1. The median of the estimates of non-maturing 1SW salmon in 2018 was 103 900 salmon (90% C.I. range 88 500 to 121 000). This value is 19% lower than the revised value for 2017 (127 900) and 30% lower than the previous five-year mean (148 500). The estimated non-maturing 1SW salmon in 2018 is the fifth lowest of the 48-year time-series.

4.3.6.3 Maturing 1SW salmon

Maturing 1SW salmon are in some areas (particularly Newfoundland) a major component of salmon stocks, and their abundance when combined with that of the 2SW age group provides an index of the majority of an entire smolt cohort.

The reconstructed distribution of the PFA of the 1SW maturing cohort of North American origin is shown in Figure 4.3.6.1 and Table 4.3.6.1. The estimated PFA of the maturing component in 2019 was 350 100 fish, 22% below the previous year revised value and 25% below the previous five-year mean (468 200). Maximum abundance of the maturing cohort was estimated at over 910 000 fish in 1981 and the recent estimate is the second lowest (after 1994) of the 49-year time-series of estimated abundance.

4.3.6.4 Total 1SW recruits (maturing and non-maturing)

The pre-fishery abundance of 1SW maturing salmon and 1SW non-maturing salmon from North America from 1971–2018 (2019 PFA requires 2SW returns in 2020) were summed to give total recruits of 1SW salmon (Figure 4.3.6.1; Table 4.3.6.1). The PFA of the 1SW cohort, estimated for 2018, was 551 700 fish, 3% higher than the revised 2017 PFA estimate (535 100), and 15% lower than the previous five-year mean (648 100). The 2018 PFA estimate ranks 38 (descending rank) in the 48-year time-series. The abundance of the 1SW cohort has declined by 66% over the time-series from a peak of 1 705 000 fish in 1975.

4.3.7 Summary on status of stocks

This update on stock status to 2019 confirms the previous assessment of status from 2018 (ICES, 2019) and shows a persistent low abundance, and in southern areas continuing declines in abundance, of all sea age groups of Atlantic salmon in North America.

In 2019, the median estimates of 2SW returns and of 2SW spawners to rivers were below the respective 2SW CLs in the six assessment regions of NAC, and are therefore suffering reduced reproductive capacity (Figure 4.3.7.1). The percentages (based on medians) of CLs attained from 2SW spawners in 2019 ranged from a low of 3% in Scotia-Fundy to 77% in Gulf. For 2SW salmon returns to rivers prior to in-river exploitation, the percentages of CL attained were minimally higher, ranging from 3% to 79%, respectively. The returns of 2SW salmon to the two southern areas (Scotia-Fundy and USA) were 6% and 25%, respectively, of the management objectives for these areas. For USA, 2SW returns are assessed relative to the management objective as adult stocking programmes for restoration efforts contribute to the number of spawners.

The rank of the estimated returns in the 1971 to 2019 time-series and the proportions of the 2SW CLs achieved in 2019 for six assessment regions in North America are shown below.

Region	Rank of 2019 returns in 1971 to 2019, (49=LOWEST)		Rank of 2019 returns in 2010 to 2019 (10=LOWEST)		Median estimate of 2019 2SW spawners as percentage of Conservation Limit (% of management objective)
	1SW	2SW	1SW	2SW	(%)
Labrador	18	13	10	9	50
Newfoundland	29	37	7	6	75
Québec	45	45	9	8	61
Gulf	47	47	8	10	77
Scotia-Fundy	44	47	5	8	3 (6)
USA	20	34	3	2	4 (27)

Estimates of PFA indicate continued low abundance of North American adult Atlantic salmon. The total population of 1SW and 2SW Atlantic salmon in the Northwest Atlantic has shown an overall declining trend since the 1970s with a period of persistent low abundance since the early 1990s. During 1993 to 2018, the total population of 1SW and 2SW Atlantic salmon was 605 000 fish, less than half of the mean abundance (1 232 000 fish) during 1971 to 1992.

The estimated maturing 1SW salmon abundance in 2019 of 350 100 fish is 22% below the 2018 estimate and the second lowest abundance of the 49-year time-series, beginning in 1971. Overall, 87% of 1SW (small) salmon returns to NAC in 2019 were from two regions (Labrador and Newfoundland).

The non-maturing 1SW PFA for 2018 (fish mostly destined to be 2SW salmon in 2019) decreased by 19% from 2017, and is the fifth lowest of the 48-year time-series. Overall, 92% of 2SW salmon returns to NAC were from three regions in 2019 (Labrador, Québec and Gulf).

The estimates of 1SW (small) salmon returns in 2019 increased from 2018 in three regions and decreased in the other three geographic areas of NAC. 1SW salmon returns remained among the lowest on record for Gulf (third lowest since 1971), Québec (fifth lowest on record) and Scotia-Fundy (sixth lowest). Returns to rivers (after commercial fisheries in Newfoundland and Labrador) of 1SW salmon have generally increased over the time-series for the NAC, mainly as a result of the commercial fishery closures in 1992 and subsequently in 1998. Important variations in annual abundances continue to be observed, such as the low returns of 2009 and 2013 and the high returns of 2011 and 2015 (Figure 4.3.2.2). Increased returns in recent years were estimated for Labrador and Newfoundland, which have contributed to this increasing trend for NAC. While the estimated 1SW salmon returns in Labrador have increased substantially over the time-series, the estimated returns in 2019 were the lowest of the last ten years. Estimated returns of 1SW salmon to Newfoundland was the fourth lowest of the last ten years.

The abundances of large salmon (MSW salmon including maiden and repeat spawners) returns in 2019 relative to 2018 increased in three areas and decreased in the other three geographic areas of NAC. Returns were particularly lower (by 41% to 52%) in the primary 2SW producing areas of NAC (Labrador, Québec, and Gulf). Over the 49-year time-series of assessment, the returns in Gulf and Scotia-Fundy were the second lowest and in Québec the fifth lowest on record.

Wild smolt-to-adult return rates to monitored rivers in eastern North America remain low, with 2018 smolt to 1SW salmon returns ranging from 0.4% for multi-sea-winter salmon stocks to 15.5% for 1SW salmon stocks and return rates of smolts in 2017 to 2SW salmon for the two rivers with data ranging from 0.3% to 1.9%. A number of monitoring programs in 2017 and 2018 were unable to estimate smolt production due to exceptional spring discharge conditions, which weakens the critical metrics of adult return rates for the few monitored populations.

Egg depositions by all sea ages combined in 2019 exceeded or equalled the river-specific CLs in 42 of the 86 assessed rivers (49%) and were less than 50% of CLs in 28 rivers (33%). Large deficiencies in egg depositions (≤10% CLs) were noted in multiple (17) rivers in the Scotia-Fundy and USA areas.

Despite major changes in fisheries, returns to the southern regions of NAC (Scotia-Fundy and USA) remain near historical lows and many populations are currently at risk of extirpation. All salmon stocks within the USA and the Scotia-Fundy regions have been or are being considered for listing under country specific species at risk legislation. Recovery Potential Assessments for the three Designatable Units of salmon in Scotia-Fundy as well as for one Designatable Unit in Québec and one in Newfoundland occurred in 2012 and 2013 to inform the requirements under the Species at Risk Act listing process in Canada (ICES, 2014).

Regional return estimates in 2019 are reflective of the overall 2019 return estimates for NAC, as Labrador and Newfoundland collectively comprised 87% of the small salmon returns, whereas Labrador, Québec, and Gulf collectively comprised 75% of the large salmon returns and 92% of the 2SW salmon returns to NAC.

Overall, the estimated PFA of 1SW non-maturing salmon in 2018 was the fifth lowest of the 48-year time-series and the estimated PFA of 1SW maturing salmon was the second lowest of the 49-year time-series. The continued low and declining abundance of salmon stocks across North America, despite significant fishery reductions, strengthens the conclusions that factors acting on survival in the first and second years at sea at both local and broad ocean scales are constraining abundance of Atlantic salmon. Declines in smolt production in some rivers of eastern North America are now being observed and are also contributing to lower adult abundance.

Table 4.1.2.1. The number of professional and recreational gillnet licences issued at Saint Pierre and Miquelon and reported landings for the period 1990 to 2019. The data for 2019 are provisional.

Year	Number of licences		Reported Landings (t)		
	Professional	Recreational	Professional	Recreational	Total
1990			1.146	0.734	1.880
1991			0.632	0.530	1.162
1992			1.295	1.024	2.319
1993			1.902	1.041	2.943
1994			2.633	0.790	3.423
1995	12	42	0.392	0.445	0.837
1996	12	42	0.951	0.617	1.568
1997	6	36	0.762	0.729	1.491
1998	9	42	1.039	1.268	2.307
1999	7	40	1.182	1.140	2.322
2000	8	35	1.134	1.133	2.267
2001	10	42	1.544	0.611	2.155
2002	12	42	1.223	0.729	1.952
2003	12	42	1.620	1.272	2.892
2004	13	42	1.499	1.285	2.784
2005	14	52	2.243	1.044	3.287
2006	13	52	1.730	1.825	3.555
2007	13	53	0.970	1.062	2.032
2008	9	55	1.60	1.85	3.45
2009	8	50	1.87	1.60	3.46
2010	9	57	1.00	1.78	2.78
2011	9	58	1.76	1.99	3.76
2012	9	60	0.28	1.17	1.45
2013	9	64	2.29	3.01	5.30
2014	12	70	2.25	1.56	3.81
2015	8	70	1.21	2.30	3.51
2016	8	70	0.98	3.75	4.73
2017	8	80	0.59	2.22	2.82
2018	9	80	0.16	1.13	1.29
2019	7	80	0.07	1.21	1.29

Table 4.1.3.1. Harvests (by weight, t), and the percent large by weight and by number in the Indigenous Peoples' Food, Social, and Ceremonial (FSC) fisheries in Canada, 1990 to 2019. The data for 2019 are provisional.

Indigenous Peoples' FSC fisheries			
		% large	
Year	Harvest (t)	by weight	by number
1990	31.9	78	
1991	29.1	87	
1992	34.2	83	
1993	42.6	83	
1994	41.7	83	58
1995	32.8	82	56
1996	47.9	87	65
1997	39.4	91	74
1998	47.9	83	63
1999	45.9	73	49
2000	45.7	68	41
2001	42.1	72	47
2002	46.3	68	43
2003	44.3	72	49
2004	60.8	66	44
2005	56.7	57	34
2006	61.4	61	39
2007	48.0	62	40
2008	62.5	66	43
2009	51.2	65	45
2010	59.1	59	38
2011	70.4	63	41
2012	59.6	62	40
2013	64.0	71	51
2014	52.9	61	41
2015	62.9	67	46
2016	64.0	72	50
2017	61.3	72	51
2018	52.5	64	44
2019	54.0	72	50

Table 4.1.3.2. Harvests (by weight, t), and the percent large by weight and number in the Labrador Resident Food Fishery, Canada, for the period 2000 to 2019. The data for 2019 are provisional.

Labrador resident food fishery			
		% Large	
Year	Harvest (t)	by weight	by number
2000	3.5	30	18
2001	4.6	33	23
2002	6.2	27	15
2003	6.7	32	21
2004	2.2	40	26
2005	2.7	32	20
2006	2.6	39	27
2007	1.7	23	13
2008	2.3	46	25
2009	2.9	42	28
2010	2.3	37	25
2011	2.1	51	37
2012	1.7	49	32
2013	2.1	65	51
2014	1.6	46	41
2015	2.0	54	38
2016	1.6	57	39
2017	1.4	58	40
2018	1.5	43	26
2019	1.6	67	47

Table 4.1.3.3. Harvests of small and large salmon by number, and the percent large by number, in the recreational fisheries of Canada for the period 1974 to 2019. The data for 2019 are provisional.

Year	Small	Large	Both Size Groups	% Large
1974	53 887	31 720	85 607	37
1975	50 463	22 714	73 177	31
1976	66 478	27 686	94 164	29
1977	61 727	45 495	107 222	42
1978	45 240	28 138	73 378	38
1979	60 105	13 826	73 931	19
1980	67 314	36 943	104 257	35
1981	84 177	24 204	108 381	22
1982	72 893	24 640	97 533	25
1983	53 385	15 950	69 335	23
1984	66 676	9 982	76 658	13
1985	72 389	10 084	82 473	12
1986	94 046	11 797	105 843	11
1987	66 475	10 069	76 544	13
1988	91 897	13 295	105 192	13
1989	65 466	11 196	76 662	15
1990	74 541	12 788	87 329	15
1991	46 410	11 219	57 629	19
1992	77 577	12 826	90 403	14
1993	68 282	9 919	78 201	13
1994	60 118	11 198	71 316	16
1995	46 273	8 295	54 568	15
1996	66 104	9 513	75 617	13
1997	42 891	6 756	49 647	14
1998	45 810	4 717	50 527	9
1999	43 667	4 811	48 478	10
2000	45 811	4 627	50 438	9
2001	43 353	5 571	48 924	11
2002	43 904	2 627	46 531	6
2003	38 367	4 694	43 061	11
2004	43 124	4 578	47 702	10
2005	33 922	4 132	38 054	11
2006	33 668	3 014	36 682	8
2007	26 279	3 499	29 778	12
2008	46 458	2 839	49 297	6
2009	32 944	3 373	36 317	9
2010	45 407	3 209	48 616	7
2011	49 931	4 141	54 072	8
2012	30 453	2 680	33 133	8

Year	Small	Large	Both Size Groups	% Large
2013	31 404	3 472	34 876	10
2014	33 339	1 343	34 682	4
2015	37 642	1 971	39 613	5
2016	35 303	1 823	37 126	5
2017	22 015	1 886	23 901	8
2018	11 757	979	12 736	8
2019	19 056	1 184	20 240	6
Previous five-year mean	28 011	1 600	29 612	6

Table 4.1.3.4. Numbers of salmon caught and released in Eastern Canadian salmon angling fisheries, for the period 1984 to 2019. Blank cells indicate no data. Released fish in the kelt fishery of New Brunswick are not included in the totals for New Brunswick nor Canada. Totals for all years prior to 1997 are incomplete and are considered minimal estimates. Estimates for 2019 are preliminary; and final figures for 2018 are shown.

	Newfoundland & Labrador			Nova Scotia			New Brunswick			Prince Edward Island			Québec			CANADA		
Year	Small	Large	Total	Small	Large	Total	Small	Large	Total	Small	Large	Total	Small	Large	Total	SMALL	LARGE	TOTAL
1984				939	1655	2594	851	14 479	15 330							1790	16 134	17 924
1985		315	315	1323	6346	7669	3963	17 815	21 778			67				5286	24 476	29 762
1986		798	798	1463	10 750	12 213	9333	25 316	34 649							10 796	36 864	47 660
1987		410	410	1311	6339	7650	10 597	20 295	30 892							11 908	27 044	38 952
1988		600	600	1146	6795	7941	10 503	19 442	29 945	767	256	1023				12 416	27 093	39 509
1989		183	183	1562	6960	8522	8518	22 127	30 645							10 080	29 270	39 350
1990		503	503	1782	5504	7286	7346	16 231	23 577			1066				9128	22 238	31 366
1991		336	336	908	5482	6390	3501	10 650	14 151	1103	187	1290				5512	16 655	22 167
1992	5893	1423	7 316	737	5093	5830	8349	16 308	24 657			1250				14 979	22 824	37 803
1993	18 196	1731	19 927	1076	3998	5074	7276	12 526	19 802							26 548	18 255	44 803
1994	24 442	5032	29 474	796	2894	3690	7443	11 556	18 999	577	147	724				33 258	19 629	52 887
1995	26 273	5166	31 439	979	2861	3840	4260	5220	9480	209	139	348		922	922	31 721	14 308	46 029
1996	34 342	6209	40 551	3526	5661	9187				472	238	710		1718	1 718	38 340	13 826	52 166
1997	25 316	4720	30 036	713	3363	4076	4870	8874	13 744	210	118	328	182	1643	1 825	31 291	18 718	50 009
1998	31 368	4375	35 743	688	2476	3164	5760	8298	14 058	233	114	347	297	2680	2 977	38 346	17 943	56 289
1999	24 567	4153	28 720	562	2186	2748	5631	8281	13 912	192	157	349	298	2693	2 991	31 250	17 470	48 720
2000	29 705	6479	36 184	407	1303	1710	6689	8690	15 379	101	46	147	44e	4008	4 453	37 347	20 526	64 482
2001	22 348	5184	27 532	527	1199	1726	6166	11 252	17 418	202	103	305	809	4674	5 483	30 052	22 412	59 387
2002	23 071	3992	27 063	829	1100	1929	7351	5349	12 700	207	31	238	852	4918	5 770	32 310	15 390	50 924
2003	21 379	4965	26 344	626	2106	2732	5375	7981	13 356	240	123	363	1238	7015	8 253	28 858	22 190	53 645
2004	23 430	5168	28 598	828	2339	3167	7517	8100	15 617	135	68	203	1291	7455	8 746	33 201	23 130	62 316

	Newfoundland & Labrador			Nova Scotia			New Brunswick			Prince Edward Island			Québec			CANADA		
Year	Small	Large	Total	Small	Large	Total	Small	Large	Total	Small	Large	Total	Small	Large	Total	SMALL	LARGE	TOTAL
2005	33 129	6598	39 727	933	2617	3550	2695	5584	8279	83	83	166	1116	6445	7 561	37 956	21 327	63 005
2006	30 491	5694	36 185	1014	2408	3422	4186	5538	9724	128	42	170	1091	6185	7 276	36 910	19 867	60 486
2007	17 719	4607	22 326	896	1520	2416	2963	7040	10 003	63	41	104	951	5392	6 343	22 592	18 600	41 192
2008	25 226	5007	30 233	1016	2061	3077	6361	6130	12 491	3	9	12	1361	7713	9 074	33 967	20 920	54 887
2009	26 681	4272	30 953	670	2665	3335	2387	8174	10 561	6	25	31	1091	6180	7 271	30 835	21 316	52 151
2010	27 256	5458	32 714	717	1966	2683	5730	5660	11 390	42	27	69	1356	7683	9 039	35 101	20 794	55 895
2011	26 240	8119	34 359	1157	4320	5477	6537	12 466	19 003	46	46	92	3100	9327	12 427	37 080	34 278	71 358
2012	20 940	4089	25 029	339	1693	2032	2504	5330	7834	46	46	92	2126	6174	8 300	25 955	17 332	43 287
2013	19 962	6770	26 732	480	2657	3137	2646	8049	10 695	12	23	35	2238	7793	10 031	25 338	25 292	50 630
2014	20 553	4410	24 963	185	1127	1312	2806	5884	8690	68	68	136	1580	4932	6 512	25 192	16 421	41 613
2015	24 861	6943	31 804	548	1260	1808	11 552	7489	19 041	68	68	136	3078	9573	12 651	40 107	25 333	65 440
2016	26 145	10 206	36 351	362	1550	1912	7130	7958	15 088	68	68	136	3905	11 533	15 438	37 610	31 315	68 925
2017	22 544	8137	30 681	330	732	1062	5935	6179	12 114	68	68	136	3191	10 173	13 364	32 068	25 289	57 357
2018 (final)	26 403	3562	29 965	526	2180	2706	4703	6978	11 681	68	68	136	2747	8776	11 523	34 447	21 564	56 011
2019 (prelim)	18 285	5072	23 357	534	1609	2143	4506	3507	8013	68	68	136	2844	9842	12 686	26 237	20 098	46 335

Table 4.1.4.1. Reported harvests and losses expressed as 2SW salmon equivalents (number of fish X 1000) in North American salmon fisheries for the period 1972 to 2019, year of 2SW harvests in North America. Only midpoints of the Monte Carlo simulated values are shown. Geographic locations are: SPM = Saint-Pierre and Miquelon, LAB = Labrador, NF = Newfoundland, QC = Québec, GF = Gulf, SF = Scotia-Fundy.

	Mixed-stock fisheries in North America					Canada – losses from all sources (terminal fisheries, catch and release mortality, bycatch mortality) in year i													
Year (i)	NF-LAB Comm / Food 1SW (Year i-1) (a)	% 1SW of total 2SW equiva-lents (Year i)	NF-LAB Comm / Food 2SW (Year i) (a)	NF-LAB Comm / Food total (Year i)	SPM (Year i)	LAB	NF	QC	GF	SF	Total	USA	North America-Total Losses	Terminal losses as % of NA Total	Green-land Total (Year i - 1)	NW At-lan-tic Total	Harvest in home-waters as % of total NW At-lantic	Estimated abun-dance in North America (2SW)	Exploita-tion rate in North America
1972	22.1	13	143.9	166.0	0.0	0.4	0.6	27.4	20.2	5.6	54.2	0.3	220.6	25	197.6	418.2	53	292.2	0.75
1973	18.9	8	205.2	224.1	0.0	1.0	0.8	32.7	15.4	6.2	56.1	0.3	280.6	20	148.2	428.8	65	362.8	0.77
1974	23.8	9	235.5	259.3	0.0	0.8	0.5	47.7	18.3	13.1	80.3	0.2	339.9	24	186.8	526.7	65	449.4	0.76
1975	23.5	9	237.2	260.7	0.0	0.3	0.5	41.1	14.0	12.5	68.4	0.4	329.5	21	154.6	484.1	68	416.1	0.79
1976	35.1	12	256.2	291.3	0.3	0.8	0.4	42.4	16.1	11.1	70.8	0.2	362.6	20	194.6	557.2	65	431.3	0.84
1977	26.8	10	240.8	267.6	0.0	1.3	0.8	42.4	29.3	13.5	87.3	1.4	356.2	25	112.9	469.1	76	473.2	0.75
1978	27.1	15	157.0	184.1	0.0	0.8	0.5	37.5	20.3	9.4	68.5	0.9	253.5	27	143.0	396.5	64	317.3	0.80
1979	13.5	13	91.9	105.4	0.0	0.6	0.1	25.3	6.2	3.8	36.1	0.4	142.0	26	103.8	245.8	58	172.0	0.83
1980	20.7	9	216.8	237.5	0.0	0.9	0.6	53.6	25.4	17.4	97.9	1.5	336.9	30	141.9	478.8	70	451.4	0.75
1981	33.8	14	200.9	234.7	0.0	0.5	0.5	44.6	14.6	12.8	73.0	1.3	309.0	24	121.0	430.0	72	365.3	0.85
1982	33.7	20	134.1	167.8	0.0	0.6	0.4	35.3	20.6	8.9	65.9	1.4	235.1	29	161.2	396.3	59	291.1	0.81
1983	25.3	19	111.3	136.6	0.3	0.4	0.4	34.6	17.3	12.3	64.9	0.4	202.3	32	145.9	348.2	58	237.1	0.85
1984	19.1	19	82.6	101.7	0.3	0.5	0.2	19.4	3.5	4.0	27.7	0.7	130.4	22	26.8	157.2	83	199.3	0.65

	Mixed-stock fisheries in North America					Canada – losses from all sources (terminal fisheries, catch and release mortality, bycatch mortality) in year i													
Year (i)	NF-LAB Comm / Food 1SW (Year i-1) (a)	% 1SW of total 2SW equiva-lents (Year i)	NF-LAB Comm / Food 2SW (Year i) (a)	NF-LAB Comm / Food total (Year i)	SPM (Year i)	LAB	NF	QC	GF	SF	Total	USA	North America-Total Losses	Terminal losses as % of NA Total	Green-land Total (Year i - 1)	NW At-lan-tic Total	Harvest in home-waters as % of total NW At-lantic	Estimated abun-dance in North America (2SW)	Exploita-tion rate in North America
1985	14.4	15	78.6	93.0	0.3	0.3	0.0	22.2	1.0	5.0	28.6	0.6	122.6	24	32.4	155.0	79	212.2	0.58
1986	19.6	16	104.7	124.4	0.3	0.5	0.0	27.3	1.8	3.0	32.6	0.6	157.8	21	99.1	256.9	61	266.2	0.59
1987	24.8	16	131.9	156.7	0.2	0.6	0.0	27.3	1.8	1.4	31.2	0.3	188.4	17	123.6	312.0	60	259.6	0.73
1988	31.6	28	81.0	112.6	0.2	0.7	0.0	27.7	1.1	1.4	30.9	0.2	144.0	22	123.9	267.9	54	214.7	0.67
1989	22.0	21	81.2	103.1	0.2	0.5	0.0	23.8	1.2	0.4	25.8	0.4	129.5	20	84.9	214.4	60	195.5	0.66
1990	19.3	25	57.2	76.6	0.2	0.4	0.0	23.0	1.4	0.7	25.4	0.7	102.9	25	43.6	146.5	70	175.9	0.59
1991	11.9	23	40.4	52.2	0.1	0.1	0.0	23.5	0.8	1.4	25.9	0.2	78.4	33	52.2	130.7	60	147.9	0.53
1992	9.9	28	25.0	34.9	0.3	0.8	0.1	24.3	1.1	1.2	27.4	0.2	62.7	44	79.6	142.3	44	145.8	0.43
1993	3.1	19	13.2	16.4	0.3	0.4	0.1	18.6	0.8	1.2	21.0	0.2	37.8	56	29.8	67.7	56	121.8	0.31
1994	2.1	15	11.9	14.0	0.4	0.5	0.2	19.3	0.6	0.8	21.4	0.0	35.7	60	1.9	37.6	95	106.9	0.33
1995	1.2	12	8.7	9.8	0.1	0.5	0.1	18.0	0.7	0.4	19.5	0.0	29.5	66	1.9	31.4	94	133.9	0.22
1996	1.0	16	5.6	6.7	0.2	0.4	0.2	17.2	0.9	0.8	19.5	0.0	26.3	74	19.2	45.5	58	114.1	0.23
1997	0.9	14	5.6	6.5	0.2	0.2	0.1	14.2	0.9	0.6	16.0	0.0	22.7	71	19.4	42.1	54	93.8	0.24
1998	1.2	40	1.8	2.9	0.3	0.2	0.1	8.0	0.4	0.3	9.0	0.0	12.2	74	13.0	25.3	48	64.4	0.19
1999	0.2	17	0.8	1.0	0.3	0.3	0.1	6.6	0.8	0.5	8.3	0.0	9.5	87	4.3	13.9	69	68.3	0.14

	Mixed-stock fisheries in North America					Canada – losses from all sources (terminal fisheries, catch and release mortality, bycatch mortality) in year i													
Year (i)	NF-LAB Comm / Food 1SW (Year i-1) (a)	% 1SW of total 2SW equivalents (Year i)	NF-LAB Comm / Food 2SW (Year i) (a)	NF-LAB Comm / Food total (Year i)	SPM (Year i)	LAB	NF	QC	GF	SF	Total	USA	North America-Total Losses	Terminal losses as % of NA Total	Greenland Total (Year i - 1)	NW Atlantic Total	Harvest in home-waters as % of total NW Atlantic	Estimated abundance in North America (2SW)	Exploitation rate in North America
2000	0.2	13	1.0	1.2	0.3	0.3	0.2	6.3	0.6	0.2	7.6	0.0	9.0	84	6.4	15.4	58	70.0	0.13
2001	0.3	18	1.3	1.6	0.2	0.3	0.1	7.1	0.9	0.3	8.6	0.0	10.5	82	5.9	16.4	64	80.8	0.13
2002	0.3	20	1.1	1.3	0.2	0.2	0.0	4.2	0.5	0.2	5.1	0.0	6.7	77	8.6	15.3	44	51.1	0.13
2003	0.3	16	1.7	2.0	0.3	0.2	0.1	6.1	0.8	0.2	7.3	0.0	9.7	76	3.2	12.9	75	78.3	0.12
2004	0.4	11	2.9	3.2	0.2	0.3	0.1	6.0	0.8	0.1	7.2	0.0	10.6	68	3.5	14.1	75	75.7	0.14
2005	0.5	18	2.2	2.6	0.3	0.3	0.1	5.3	1.0	0.1	6.8	0.0	9.8	70	4.3	14.1	69	78.1	0.13
2006	0.6	19	2.4	3.0	0.5	0.2	0.1	4.9	0.8	0.1	6.2	0.0	9.6	64	4.2	13.7	70	74.6	0.13
2007	0.6	21	2.1	2.6	0.2	0.2	0.0	4.7	0.9	0.1	6.0	0.0	8.8	68	4.9	13.8	64	69.6	0.13
2008	0.5	14	3.0	3.5	0.4	0.2	0.1	4.5	0.8	0.1	5.7	0.0	9.7	59	6.6	16.3	59	76.7	0.13
2009	0.5	17	2.6	3.1	0.4	0.2	0.1	4.6	0.8	0.1	5.9	0.0	9.4	63	7.5	16.9	55	90.2	0.10
2010	0.4	13	2.9	3.3	0.5	0.2	0.1	4.3	0.9	0.1	5.6	0.0	9.3	60	6.7	16.0	58	73.4	0.13
2011	0.5	14	3.4	4.0	1.0	0.2	0.0	5.9	1.6	0.1	7.8	0.0	12.8	61	8.8	21.5	59	146.9	0.09
2012	0.6	16	3.3	3.9	0.2	0.1	0.0	4.5	0.8	0.1	5.4	0.0	9.4	57	6.9	16.3	58	76.9	0.12
2013	0.5	10	5.0	5.6	1.2	0.2	0.1	4.9	1.1	0.0	6.2	0.0	13.0	48	7.1	20.1	65	113.5	0.11
2014	0.4	12	3.1	3.5	0.6	0.1	0.0	3.5	0.4	0.0	4.0	0.0	8.1	49	9.6	17.7	46	83.9	0.10

	Mixed-stock fisheries in North America					Canada – losses from all sources (terminal fisheries, catch and release mortality, bycatch mortality) in year i													
Year (i)	NF-LAB Comm / Food 1SW (Year i-1) (a)	% 1SW of total 2SW equivalents (Year i)	NF-LAB Comm / Food 2SW (Year i) (a)	NF-LAB Comm / Food total (Year i)	SPM (Year i)	LAB	NF	QC	GF	SF	Total	USA	North America-Total Losses	Terminal losses as % of NA Total	Greenland Total (Year i - 1)	NW At-lan-tic Total	Harvest in home-waters as % of total NW Atlantic	Estimated abundance in North America (2SW)	Exploitation rate in North America
2015	0.5	9	4.8	5.3	0.4	0.1	0.1	4.1	0.5	0.0	4.7	0.0	10.4	46	11.4	21.8	48	121.2	0.09
2016	0.5	11	4.3	4.8	0.3	0.2	0.1	4.3	0.5	0.0	5.2	0.0	10.3	50	11.7	22.0	47	115.2	0.09
2017	0.4	8	4.8	5.2	0.1	0.2	0.1	3.8	0.5	0.0	4.6	0.0	9.9	46	5.6	15.6	64	110.8	0.09
2018	0.4	12	3.2	3.6	0.1	0.1	0.0	3.1	0.5	0.0	3.7	0.0	7.4	50	5.4	12.8	58	88.8	0.08
2019	0.5	9	4.5	5.0	0.2	0.1	0.0	3.1	0.3	0.0	3.6	0.0	8.7	41	9.6	18.3	48	66.6	0.13

Variations in numbers from previous assessments are due to updates to data inputs and to stochastic variation from Monte Carlo simulation.

NF-LAB Comm / Food 1SW (Year i-1) = Catch of 1SW non-maturing * 0.677057 (M of 0.03 per month for 13 months to July for Canadian terminal fisheries).

NF-LAB Comm / Food 2SW (Year i) = catch of 2SW salmon * 0.970446 (M of 0.03 per month for 1 month to July of Canadian terminal fisheries).

Canada: Losses from all sources = 2SW returns - 2SW spawners (includes losses from harvests from catch and release mortality and other in-river losses such as bycatch mortality but excludes the fisheries at St-Pierre and Miquelon and NF-LAB Comm / Food fisheries).

a - starting in 1998 there was no commercial fishery in Labrador; numbers reflect harvests of the Indigenous and residential subsistence fisheries.

Greenland total catch = estimated catch in year i -1 of 1SW non-maturing salmon of North American origin at Greenland * 0.719 which is the discounted catch for 11 months of mortality at sea as returning 2SW salmon to eastern North America (M of 0.03 per month for 11 months).

Table 4.1.5.1. Correspondence between ICES areas used for the assessment of status of North American salmon stocks and the reporting groups (Figure 4.1.5.1 and Figure 4.1.5.2) defined using the SNP range wide baseline (Jeffrey *et al.*, 2018).

ICES region	Reporting group	Group acronym
Québec (North)	Ungava	UNG
Labrador	Labrador Central	LAC
	Lake Melville	MEL
	Labrador South	LAS
Québec	St Lawrence North Shore Lower	QLS
	Anticosti	ANT
	Gaspe Peninsula	GAS
	Québec City Region	QUE
Gulf	Gulf of St Lawrence	GUL
Scotia-Fundy	Inner Bay of Fundy	IBF
	Eastern Nova Scotia	ENS
	Western Nova Scotia	WNS
	Saint John River & Aquaculture	SJR
Newfoundland	Northern Newfoundland	NNF
	Western Newfoundland	WNF
	Newfoundland 1	NF1
	Newfoundland 2	NF2
	Fortune Bay	FTB
	Burin Peninsula	BPN
	Avalon Peninsula	AVA
USA	Maine, United States	USA
Europe	Spain	SPN
	France	FRN
	European Brood stock	EUB
	United Kingdom/Ireland	BRI
	Barents-White Seas	BAR
	Baltic Sea	BAL

ICES region	Reporting group	Group acronym
	Southern Norway	SNO
	Northern Norway	NNO
	Iceland	ICE
	Greenland	GL

Table 4.1.5.2. Genetic mixture analysis of Labrador subsistence fisheries for 2019 using the SNP range wide baseline (Jeffrey *et al.*, 2018). Mean percent values (and 95% credible interval) by range wide reporting groups (Figure 4.1.5.1 and Figure 4.1.5.2). Small <63 cm, Large >=63 cm. Note that credible intervals with a lower bound including zero indicate little support for the mean assignment value.

Reporting Group	**Total**	**Small**	**Large**	**SFA 1A**	**SFA 1B**	**SFA 2**
Spain	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
France	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
European Brood stock	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
United Kingdom / Ireland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Barents-White Seas	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Baltic Sea	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Southern Norway	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Northern Norway	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Iceland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Greenland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Maine, United States	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Western Nova Scotia	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Eastern Nova Scotia	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Inner Bay of Fundy	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Gulf of St Lawrence	0.7 (0.0, 1.8)	1.1 (0.1, 2.7)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	1.1 (0.1, 2.6)
Saint John River Aquaculture	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Québec City Region	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Gaspe Peninsulas	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)

Reporting Group	Total	Small	Large	SFA 1A	SFA 1B	SFA 2
Anticosti	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
St Lawrence North Shore Lower	0.9 (0.2, 2.0)	1.0 (0.2, 2.4)	0.7 (0.0, 2.6)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	1.3 (0.3, 2.8)
Newfoundland 2	0.1 (0.0, 0.5)	0.6 (0.0, 2.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Fortune Bay	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0))	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Burin Peninsula	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Avalon Peninsula	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Newfoundland 1	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Western New-foundland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Northern New-foundland	1.0 (0.3, 2.1)	1.1 (0.3, 2.6)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	1.4 (0.4, 3.0)
Labrador South	**66.4 (61.4, 71.2)**	**76.4 (71.1, 81.2)**	**50.5 (41.2, 59.6)**	**0.0 (0.0, 0.0)**	**0.0 (0.0, 0.0)**	**92.4 (88.3, 95.3)**
Lake Melville	**18.6 (15.0, 22.5)**	**14.8 (10.9, 19.3)**	**19.9 (13.5, 27.5)**	**14.2 (6.1, 24.8)**	**93.2 (85.0, 98.7)**	**0.7 (0.1, 1.9)**
Labrador Central	**10.9 (7.3, 14.9)**	**3.7 (1.2, 6.8)**	**26.9 (18.6, 36.0)**	**84.1 (73.0, 92.8)**	**0.0 (0.0, 0.0)**	**0.0 (0.0, 0.0)**
Ungava	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Samples	**485**	**329**	**146**	**62**	**78**	**345**

Table 4.1.5.3. Genetic mixture analyses of Atlantic salmon (small salmon < 63 cm, large salmon ≥63 cm) samples from the Saint Pierre and Miquelon Atlantic salmon fishery in 2019 using the range wide SNP baseline (Jeffrey *et al.*, 2018). Mean and 95% credible interval percent values by range wide reporting groups are shown (Figure 4.1.5.1 and Figure 4.1.5.2) .Note that credible intervals with a lower bound including zero indicate little support for the mean assignment value.

Reporting Group	Total	Small	Large
Spain	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
France	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
European Brood stock	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
United Kingdom/Ireland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Barents-White Seas	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Baltic Sea	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Southern Norway	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Northern Norway	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Iceland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Greenland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Maine, United States	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Western Nova Scotia	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Eastern Nova Scotia	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Inner Bay of Fundy	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Gulf of St Lawrence	**41.7** **(28.4, 55.4)**	**34.1** **(19.2, 50.4)**	**48.9** **(24.6, 73.5)**
St John River & Aquaculture	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Québec City Region	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Gaspe Peninsula	**30.2** **(18.4, 43.6)**	**31.8** **(17.9, 47.2)**	**30.6** **(10.8, 54.6)**

Reporting Group	**Total**	**Small**	**Large**
Anticosti	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
St Lawrence N. Shore Lower	**2.3** **(0.1, 7.8)**	0.0 (0.0, 0.0)	**5.4** **(0.2, 18.5)**
Newfoundland 2	**7.3** **(0.2, 17.1)**	**10.6** **(2.6, 22.0)**	0.0 (0.0, 0.0)
Fortune Bay	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Burin Peninsula	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Avalon Peninsula	1.6 (0.0, 5.8)	**2.3** **(0.1, 8.4)**	0.0 (0.0, 0.0)
Newfoundland 1	**7.9** **(2.2, 16.3)**	**8.9** **(2.5, 18.8)**	4.9 (0.0, 17.5)
Western Newfoundland	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Northern Newfoundland	**4.0** **(0.1, 12.3)**	**4.4** **(0.4, 12.2)**	0.0 (0.0, 0.0)
Labrador South	**2.9** **(0.1, 8.3)**	**4.3** **(0.3, 11.9)**	0.0 (0.0, 0.0)
Lake Melville	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Labrador Central	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Ungava	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Samples	**63**	**44**	**19**

Table 4.3.1.1. Estimated smolt production by smolt migration year in monitored rivers of eastern North America 1991 to 2019.

Smolt Migration Year	USA		Scotia-Fundy				Gulf				
	Narraguagus	Sheepscot	Nashwaak	LaHave	St Mary's (West Br.)	Middle	Margaree	Northwest Mira-michi	Southwest Mira-michi	Restigouche	Kedgwick
1991											
1992											
1993											
1994											
1995											
1996				20 511							
1997	2749			16 550							
1998	2845		22 750	15 600							
1999	4247		28 500	10 420				390 500			
2000	1843		15 800	16 300				162 000			
2001	2562		11 000	15 700				220 000	306 300		
2002	1774		15 000	11 860			63 200	241 000	711 400	360 698	174 162
2003	1201		9000	17 845			83 100	286 000	48 500	577 895	69 004
2004	1284		13 600	20 613			105 800	368 000	1 167 000	599 625	84 953
2005	1287		5 200	5270	7350		94 200	151 200		598 094	73 563
2006	2339		25 400	22 971	25 100		113 700	435 000	1 330 000	414 597	127 194
2007	1177		21 550	24 430	16 110		112 400		1 344 000	944 068	108 899

Smolt Migration Year	USA		Scotia-Fundy				Gulf				
	Narraguagus	Sheepscot	Nashwaak	LaHave	St Mary's (West Br.)	Middle	Margaree	Northwest Mira-michi	Southwest Mira-michi	Restigouche	Kedgwick
2008	962		7 300	14 450	15 217		128 800		901 500	494 248	47 020
2009	1176	1498	15 900	8644	14 820		96 800		1 035 000	552 013	136 905
2010	2149	2231	12 500	16 215					2 165 000	610 462	94 246
2011	1404	1639	8750					768 000		720 238	268 288
2012	969	849	11 060							729 842	158 330
2013	1237	829	10 120	7159		11 103				464 256	103 017
2014	1615	542	11 100	29 175		11 907				237 660	55 807
2015	1201	572	7900	6664		24 110				535 084	18 1624
2016		983	7150	25 849		14 848				267 512	58 534
2017		985			15 190					289 129	52 788
2018	604	883				9 554				194 485	57 077
2019	829	576	8710		1763					334 001	54 920

Table 4.3.1.1 (continued). Estimated smolt production by smolt migration year in monitored rivers of eastern North America 1991 to 2019.

Smolt Migration Year	Québec			Newfoundland				
	St Jean	De la Trinite	Vieux-Fort	Conne	Rocky	Campbellton	Western Arm Brook	Garnish
1991	113 927	40 863		74 645	7732		13 453	
1992	154 980	50 869		68 208	7813		15 405	
1993	142 972	86 226		55 765	5115	31 577	13 435	
1994	74 285	55 913		60 762	9781	41 663	9 283	
1995	60 227	71 899		62 749	7577	39 715	15 144	
1996	104 973	61 092		94 088	14 261	58 369	14 502	
1997		31 892		100 983	16 900	62 050	23 845	
1998	95 843	28 962		69 841	12 163	50 441	17 139	
1999	114 255	56 557		63 658	8625	47 256	13 500	
2000	50 993	39 744		60 777	7616	35 596	12 706	
2001	109 845	70 318		86 899	9392	37 170	16 013	
2002	71 839	44 264		81 806	10 144	32 573	14 999	
2003	60 259	53 030		71 479	4440	35 089	12 086	
2004	54 821	27 051		79 667	13 047	32 780	17 323	
2005	96 002	34 867		66 196	15 847	30 123	8 607	
2006	102 939			35 487	13 200	33 302	20 826	
2007	135 360	42 923		63 738	12 355	35 742	16 621	
2008	45 978	35 036		68 242	18 338	40 390	17 444	

Smolt Migration Year	Québec			Newfoundland				
	St Jean	De la Trinite	Vieux-Fort	Conne	Rocky	Campbellton	Western Arm Brook	Garnish
2009	37 297	32 680		71 085	14 041	36 722	18 492	
2010	47 187	37 500		54 392	15 098	41 069	19 044	
2011	45 050	44 400		50 701	9311	37 033	20 544	
2012	40 787	45 108		51 220	5673	44 193	13 573	
2013	36 849	42 378		66 261	6989	40 355	19 710	
2014	56 456	30 741	30 873	56 224	9901	45 630	19 771	
2015		47 566	25 096	32 557	6454	32 759	14 278	
2016	58 307	42 269	28 234		4542	44 747	14 255	
2017	34 261	27 433	34 447	58 803	5233	35 910	15 439	11 833
2018	38 356	35 519	16 046		3600	38 464	13 317	10 425
2019	36 988	28 230		25 241	1149	41 040	12 732	16 405

Table 4.3.2.1. Estimated small salmon returns (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Returns for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	49.2	135.6	23.7	63.0	26.5	NA	NA	34.2	120.3	19.4	53.9	22.8	NA	NA	72.5	151.0	27.9	72.1	30.3	NA	NA
1971	64.4	118.9	18.7	49.7	18.9	0.0	271.4	44.7	105.5	15.3	42.7	16.0	0.0	244.3	95.3	132.1	22.1	56.9	21.7	0.0	305.6
1972	48.7	110.6	15.6	62.9	17.0	0.0	255.7	33.7	97.5	12.8	53.6	14.1	0.0	231.3	71.6	123.5	18.4	72.0	19.8	0.0	283.1
1973	14.0	159.8	20.7	63.2	24.5	0.0	282.4	9.4	142.0	17.0	54.1	20.8	0.0	260.7	19.8	177.6	24.5	72.2	28.1	0.0	304.1
1974	54.1	120.6	21.0	98.4	43.6	0.1	338.8	37.4	106.9	17.2	83.8	37.1	0.1	309.0	79.3	134.0	24.8	112.9	50.0	0.1	371.6
1975	102.5	151.0	22.7	88.3	33.9	0.1	399.8	71.5	133.4	18.5	75.6	30.5	0.1	358.4	152.5	169.0	26.6	101.1	37.3	0.1	453.5
1976	74.2	158.3	25.0	128.6	52.8	0.2	440.5	51.1	139.0	20.4	110.8	46.6	0.2	400.8	108.9	178.0	29.5	146.8	59.1	0.2	484.8
1977	65.5	159.5	22.7	46.3	46.2	0.1	341.7	45.6	139.9	18.6	40.0	40.3	0.1	309.1	96.9	179.0	26.8	52.6	52.0	0.1	378.7
1978	32.7	139.4	21.2	41.1	15.8	0.2	251.4	22.9	121.9	17.4	36.2	14.5	0.2	228.8	48.1	156.7	25.0	46.0	17.1	0.2	275.0
1979	42.3	151.9	27.0	72.2	48.8	0.3	343.8	29.3	133.1	22.2	62.4	42.3	0.2	315.7	63.0	170.7	32.0	82.1	55.4	0.3	373.9
1980	96.0	172.2	37.2	63.2	70.6	0.8	441.3	66.3	152.4	30.5	54.6	62.8	0.8	400.7	142.8	192.4	44.0	71.9	78.5	0.8	493.1
1981	106.3	225.5	52.0	106.4	59.4	1.1	552.5	72.6	198.1	42.7	85.4	51.0	1.1	498.6	157.8	253.5	61.4	127.3	67.8	1.1	615.8
1982	73.3	200.6	29.6	120.9	36.1	0.3	462.9	50.4	177.3	24.3	96.3	31.4	0.3	418.1	109.5	224.2	34.9	146.2	40.8	0.3	511.8
1983	46.1	156.8	22.5	37.2	22.6	0.3	286.8	31.7	137.7	18.4	29.6	19.8	0.3	259.4	68.4	175.9	26.5	44.7	25.4	0.3	316.6
1984	24.1	206.6	25.2	54.4	42.8	0.6	354.4	16.8	179.6	22.9	44.7	36.6	0.6	323.3	35.6	233.3	27.5	63.9	48.9	0.6	385.4
1985	43.1	195.5	26.7	86.0	47.5	0.4	400.8	29.8	167.7	24.2	68.3	40.2	0.4	361.8	64.3	222.9	29.2	104.2	54.8	0.4	439.8
1986	65.7	200.1	38.3	161.6	49.3	0.8	517.4	45.1	174.9	35.3	127.3	41.6	0.8	466.2	97.8	226.0	41.3	195.9	56.9	0.8	571.8
1987	81.7	135.4	43.9	123.6	51.2	1.1	439.4	56.2	118.4	40.1	98.5	43.3	1.1	393.5	122.6	152.5	47.6	149.0	59.2	1.1	489.4

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1988	75.7	217.4	50.4	173.7	51.9	1.0	572.4	51.8	190.4	46.3	137.6	44.1	1.0	515.9	112.8	244.3	54.5	209.2	59.7	1.0	630.4
1989	52.0	107.7	39.8	103.3	54.6	1.3	360.1	35.7	94.8	36.7	81.8	46.5	1.2	325.8	77.3	120.4	43.0	125.4	62.8	1.3	396.7
1990	30.2	152.3	45.2	118.0	55.3	0.7	402.7	20.8	138.1	41.9	93.8	46.5	0.7	369.8	45.0	166.6	48.5	142.2	64.0	0.7	436.1
1991	24.3	105.7	35.3	86.1	28.2	0.3	280.7	16.6	96.3	32.7	68.2	24.5	0.3	257.0	36.6	115.0	37.8	103.8	32.0	0.3	304.3
1992	34.3	229.2	39.8	193.6	34.0	1.2	533.3	24.3	200.1	36.8	165.2	29.4	1.2	489.8	50.9	258.0	42.8	222.3	38.7	1.2	577.9
1993	45.6	265.5	34.3	137.7	25.7	0.5	510.8	33.2	235.6	31.9	89.9	21.9	0.5	449.9	66.7	295.7	36.8	184.8	29.5	0.5	571.4
1994	34.1	161.1	32.8	67.9	10.5	0.4	307.8	25.2	138.9	30.5	57.7	9.4	0.4	280.5	48.3	183.3	35.2	78.0	11.6	0.4	335.5
1995	47.7	203.9	26.4	61.1	20.0	0.2	360.9	35.8	173.3	24.5	52.3	17.5	0.2	325.3	66.7	234.9	28.3	70.0	22.5	0.2	397.3
1996	89.9	313.7	35.2	57.4	31.8	0.7	531.1	67.8	269.4	32.8	48.3	27.5	0.6	478.3	127.4	357.3	37.7	66.6	36.1	0.7	586.8
1997	95.3	176.9	26.6	31.1	9.4	0.4	340.7	73.6	159.0	24.5	25.2	8.2	0.4	310.3	130.4	195.0	28.7	37.0	10.5	0.4	379.9
1998	151.5	183.7	28.3	40.6	20.4	0.4	425.1	102.9	171.5	25.8	34.6	18.7	0.4	373.8	199.8	196.3	30.8	46.6	22.0	0.4	475.3
1999	147.1	201.3	29.9	36.3	10.6	0.4	425.8	100.0	185.5	27.5	31.6	9.8	0.4	374.7	194.6	216.8	32.4	40.9	11.4	0.4	476.6
2000	182.1	228.7	27.6	51.5	12.4	0.3	502.8	123.9	216.7	24.5	45.3	11.3	0.3	442.4	240.0	240.7	30.7	57.9	13.4	0.3	562.0
2001	145.7	156.2	18.9	42.8	5.4	0.3	369.3	98.8	148.1	17.2	37.5	5.0	0.3	321.8	192.1	164.5	20.7	48.1	5.8	0.3	416.5
2002	103.0	155.6	30.3	68.6	9.9	0.5	367.8	66.3	143.1	28.0	59.6	9.0	0.4	327.8	138.7	168.0	32.5	77.7	10.7	0.5	407.4
2003	85.9	242.5	25.2	41.4	5.8	0.2	401.1	51.9	232.9	23.2	35.9	5.3	0.2	364.9	119.1	252.1	27.2	47.1	6.3	0.2	436.3
2004	95.0	210.0	34.2	76.5	8.4	0.3	424.4	72.4	192.3	30.6	65.7	7.6	0.3	392.7	117.8	228.0	37.6	87.4	9.2	0.3	456.2
2005	220.9	221.5	23.0	47.3	7.5	0.3	520.8	166.1	176.8	20.8	39.3	6.8	0.3	446.9	275.7	266.6	25.2	55.2	8.2	0.3	594.1

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2006	213.7	212.8	28.1	58.3	10.3	0.5	523.7	140.3	194.2	25.9	48.4	9.3	0.4	447.4	286.7	231.1	30.3	68.1	11.3	0.5	599.6
2007	194.5	183.6	21.4	41.4	7.7	0.3	449.0	138.2	158.6	19.4	33.1	7.0	0.3	385.8	251.1	208.6	23.4	49.7	8.5	0.3	511.6
2008	204.0	247.9	35.6	63.9	15.4	0.8	567.7	149.1	222.4	32.6	50.6	13.9	0.8	504.3	258.8	273.4	38.5	77.1	16.8	0.8	630.7
2009	102.6	222.7	20.8	25.5	4.2	0.2	375.6	60.2	194.0	19.0	20.4	3.8	0.2	322.7	144.6	250.9	22.7	30.6	4.6	0.2	428.6
2010	122.1	267.7	26.5	74.0	14.9	0.5	505.4	82.9	256.0	24.2	64.4	13.4	0.5	462.7	160.8	279.3	28.9	83.4	16.4	0.5	547.8
2011	247.2	243.4	37.4	76.3	9.4	1.1	614.5	148.3	216.4	34.4	62.4	8.5	1.1	511.7	346.1	270.7	40.4	90.5	10.4	1.1	718.8
2012	174.0	270.5	23.7	18.8	0.6	0.0	487.4	112.5	250.7	21.5	15.0	0.6	0.0	422.3	234.8	290.5	25.8	22.6	0.7	0.0	552.0
2013	155.9	187.9	19.2	24.5	2.1	0.1	389.6	91.0	172.4	17.4	19.5	1.9	0.1	323.1	220.3	203.3	21.0	29.6	2.3	0.1	456.2
2014	268.2	169.9	23.9	16.7	1.4	0.1	480.4	184.9	155.1	21.7	13.4	1.3	0.1	396.0	350.4	184.8	26.1	20.1	1.6	0.1	563.1
2015	257.0	283.6	36.9	43.0	4.2	0.2	624.9	182.9	253.3	33.7	37.0	3.8	0.1	543.7	331.7	313.5	40.0	49.0	4.6	0.2	706.5
2016	204.7	191.1	33.2	26.2	2.6	0.2	458.7	119.7	166.5	30.0	20.8	2.3	0.2	369.2	290.8	215.9	36.4	31.6	2.8	0.2	547.7
2017	163.8	170.3	24.4	23.9	3.9	0.4	386.9	88.7	140.5	21.8	19.6	3.5	0.4	305.7	238.1	200.7	26.9	28.1	4.3	0.4	467.8
2018	285.6	94.6	23.8	19.6	1.2	0.3	425.2	178.4	83.3	21.6	15.7	1.0	0.3	317.7	392.9	106.2	25.9	23.5	1.4	0.3	532.9
2019	117.5	171.4	20.4	19.2	3.5	0.4	332.1	67.9	137.7	18.3	15.4	3.2	0.4	270.2	165.5	205.0	22.4	23.0	3.8	0.4	392.5
% Change [(2019–2018)/2018]																					
	-59%	81%	-14%	-2%	189%	23%	-22%														
Rank (highest = 1 to lowest) over time-series (1971 to 2019)																					
	18	29	45	47	44	20	42														

Table 4.3.2.2. Estimated large salmon returns (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Returns for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	10.0	14.9	103.4	69.5	20.3	NA	218.5	5.0	11.8	84.8	67.2	18.0	NA	197.9	17.1	17.9	121.9	72.0	22.6	NA	238.9
1971	14.5	12.6	59.2	40.1	15.9	0.7	143.3	7.1	10.0	48.6	37.6	14.1	0.6	128.3	24.5	15.1	69.9	42.5	17.6	0.7	158.7
1972	12.4	12.7	77.2	57.0	19.0	1.4	180.1	6.1	10.1	63.4	49.0	17.1	1.4	161.5	20.9	15.2	91.1	65.1	20.9	1.4	198.5
1973	17.3	17.4	85.1	53.4	14.8	1.4	189.7	8.5	13.7	69.9	45.6	13.4	1.4	168.8	29.3	20.9	100.6	61.2	16.1	1.4	211.7
1974	17.0	14.3	114.4	77.6	28.6	1.4	253.9	8.3	12.7	93.6	65.8	26.3	1.4	226.7	28.8	15.9	135.0	89.4	30.8	1.4	280.7
1975	15.9	18.4	97.0	50.3	30.6	2.3	215.2	7.8	16.1	79.6	43.0	28.0	2.3	192.7	26.8	20.7	114.5	57.7	33.2	2.4	237.9
1976	18.3	16.6	96.7	48.7	28.8	1.3	211.0	9.0	14.6	79.2	41.4	26.0	1.3	188.4	30.8	18.6	113.8	56.1	31.6	1.3	234.1
1977	16.2	14.6	113.9	87.8	38.1	2.0	273.1	8.0	12.9	93.3	75.2	34.6	2.0	245.9	27.5	16.3	134.2	100.4	41.5	2.0	300.4
1978	12.7	11.3	102.5	43.8	22.3	4.2	197.2	6.2	10.3	84.2	38.8	20.6	4.2	176.0	21.4	12.3	120.9	48.9	24.0	4.2	218.6
1979	7.2	7.2	56.5	17.9	12.8	1.9	103.8	3.6	6.3	46.3	15.7	11.6	1.9	92.2	12.2	8.1	66.6	20.0	14.0	2.0	115.5
1980	17.3	12.0	134.4	62.5	43.7	5.8	276.1	8.6	11.1	110.0	54.7	39.6	5.7	248.1	29.3	13.0	158.4	70.3	47.9	5.8	305.0
1981	15.6	28.9	105.7	39.4	28.2	5.6	223.8	7.7	25.3	86.6	32.9	25.5	5.6	200.4	26.4	32.4	124.6	45.7	31.0	5.7	247.0
1982	11.6	11.6	93.7	53.9	23.6	6.1	201.0	5.7	10.1	76.8	42.8	21.5	6.0	178.1	19.4	13.1	110.5	65.5	25.8	6.1	223.8
1983	8.3	12.5	77.0	40.7	20.6	2.2	161.5	4.1	11.3	63.1	33.8	18.4	2.1	144.2	14.1	13.6	90.7	47.6	22.8	2.2	178.6
1984	6.0	12.4	63.7	32.6	24.5	3.2	142.6	2.9	9.1	60.7	23.4	21.2	3.2	131.0	10.1	15.6	66.7	42.0	27.9	3.3	154.6
1985	4.7	11.0	65.9	44.4	34.2	5.5	165.9	2.3	7.8	62.0	31.9	29.3	5.5	151.0	8.0	14.2	69.8	57.2	39.1	5.6	181.2
1986	8.2	12.3	78.1	68.7	28.3	6.2	201.8	4.0	9.5	74.0	49.5	23.8	6.1	180.8	13.8	15.1	82.1	87.8	32.7	6.2	223.1
1987	11.0	8.4	73.5	46.5	17.7	3.1	160.5	5.4	6.4	70.0	34.0	15.0	3.1	145.2	18.6	10.4	77.0	59.0	20.3	3.1	176.0
1988	6.9	13.0	81.0	53.3	16.4	3.3	174.3	3.4	9.9	76.4	39.4	13.7	3.3	158.2	11.6	16.1	85.6	67.5	19.2	3.3	190.5
1989	6.7	6.9	73.7	42.4	18.5	3.2	151.6	3.3	5.4	70.0	31.2	15.6	3.2	138.6	11.2	8.5	77.4	53.7	21.4	3.2	164.7
1990	3.8	10.3	72.5	56.6	16.0	5.1	164.3	1.9	8.4	68.2	39.7	13.5	5.0	146.3	6.4	12.2	76.9	73.2	18.6	5.1	182.4
1991	1.9	7.6	65.3	57.4	15.7	2.6	150.5	0.9	6.1	61.7	39.6	13.4	2.6	132.1	3.1	9.0	69.0	75.1	17.8	2.7	169.1
1992	7.6	31.5	65.6	60.0	14.3	2.5	181.6	4.0	22.2	61.7	51.4	12.3	2.4	167.5	12.7	40.8	69.4	68.7	16.3	2.5	196.2

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1993	9.4	17.1	50.4	64.3	10.1	2.2	154.0	5.9	13.9	48.6	34.9	8.9	2.2	123.9	15.1	20.4	52.2	93.2	11.2	2.3	183.5
1994	12.9	17.4	51.0	41.3	6.3	1.3	130.7	8.5	13.8	49.2	33.1	5.7	1.3	119.9	20.3	20.9	52.7	49.4	7.0	1.4	142.0
1995	25.5	19.1	59.2	48.2	7.5	1.7	161.7	18.0	14.7	57.3	41.1	6.6	1.7	149.5	37.3	23.4	61.1	55.2	8.4	1.8	175.8
1996	18.8	28.9	53.6	40.8	10.9	2.4	155.9	13.4	23.7	51.4	32.7	9.6	2.4	143.8	27.7	34.1	55.8	49.0	12.2	2.4	168.9
1997	16.2	28.0	44.2	35.8	5.6	1.6	131.9	11.6	23.0	42.4	28.2	5.0	1.6	121.0	23.8	33.0	46.0	43.4	6.2	1.6	143.2
1998	13.5	35.3	33.9	30.3	3.8	1.5	118.3	8.0	27.5	32.1	24.8	3.5	1.5	106.9	18.9	43.1	35.7	35.7	4.2	1.5	129.7
1999	16.2	32.0	37.0	27.4	4.9	1.2	118.7	9.6	25.0	34.8	23.2	4.6	1.2	107.7	22.6	39.2	39.2	31.7	5.3	1.2	129.6
2000	22.0	27.0	35.4	30.2	2.9	0.5	118.0	13.0	23.0	32.5	25.6	2.6	0.5	106.5	30.9	31.1	38.3	34.9	3.1	0.5	129.4
2001	23.3	17.9	37.2	39.9	4.7	0.8	123.7	13.7	15.2	34.2	35.0	4.3	0.8	112.0	32.7	20.6	40.1	44.9	5.1	0.8	135.3
2002	16.9	16.8	26.5	23.5	1.6	0.5	85.7	9.8	13.7	24.2	19.7	1.4	0.5	76.6	24.0	19.9	28.8	27.2	1.7	0.5	94.9
2003	14.3	24.5	42.1	39.9	3.5	1.2	125.4	7.5	19.4	38.8	33.6	3.2	1.2	114.2	21.0	29.5	45.4	46.2	3.9	1.2	136.8
2004	16.9	22.2	36.3	39.5	3.1	1.3	119.4	11.6	17.0	33.8	32.3	2.8	1.3	108.5	22.5	27.5	38.9	46.7	3.4	1.3	130.3
2005	21.0	28.4	35.4	38.2	2.0	1.0	126.0	12.1	20.6	33.1	31.0	1.8	1.0	111.7	29.8	36.3	37.7	45.4	2.2	1.0	140.3
2006	21.0	35.6	32.8	38.1	3.0	1.0	131.5	13.3	29.9	30.6	31.4	2.7	1.0	119.2	28.9	41.4	34.9	44.7	3.3	1.0	143.9
2007	21.9	29.6	30.0	34.9	1.6	1.0	119.0	12.9	23.4	28.0	29.5	1.5	0.9	106.2	30.9	35.8	32.2	40.2	1.7	1.0	131.6
2008	26.3	28.9	36.0	28.7	3.3	1.8	124.9	15.9	22.5	32.8	23.0	2.9	1.8	110.8	36.5	35.2	39.2	34.5	3.6	1.8	138.9
2009	39.2	34.4	35.1	36.3	3.1	2.1	150.3	20.7	24.0	32.7	30.6	2.8	2.1	127.5	58.0	45.0	37.5	41.9	3.4	2.1	173.4
2010	18.9	35.4	37.8	32.9	2.5	1.1	128.6	11.6	28.7	35.3	27.5	2.3	1.1	116.8	26.1	42.0	40.4	38.4	2.7	1.1	140.2
2011	57.7	43.5	48.8	67.1	4.8	3.1	224.9	33.0	31.5	45.6	53.6	4.3	3.1	193.3	82.3	55.6	51.9	80.5	5.3	3.1	256.5
2012	33.8	28.9	34.6	27.6	1.3	0.9	127.1	20.6	23.4	32.2	22.6	1.2	0.9	111.6	47.1	34.5	36.9	32.7	1.4	0.9	142.7
2013	64.0	37.8	39.1	35.9	3.2	0.5	180.5	39.5	25.9	36.6	28.7	2.8	0.5	151.6	88.8	49.5	41.5	43.2	3.5	0.5	209.6
2014	61.8	20.2	22.2	24.0	0.8	0.3	129.4	38.8	16.5	20.9	19.0	0.7	0.3	105.3	85.3	24.0	23.5	28.9	0.8	0.3	153.5
2015	88.9	36.9	36.2	33.6	0.7	0.8	197.2	53.7	29.1	33.7	27.4	0.7	0.8	160.3	123.9	44.6	38.6	39.7	0.8	0.8	233.4
2016	72.1	24.6	38.7	36.2	1.6	0.4	173.5	39.6	19.4	36.0	28.2	1.4	0.4	139.5	104.6	29.7	41.4	44.2	1.7	0.4	207.7
2017	76.0	22.7	37.9	28.2	1.2	0.7	166.8	36.5	17.6	35.1	22.7	1.1	0.7	126.7	116.9	27.8	40.8	33.8	1.3	0.7	208.3
2018	46.0	10.2	28.5	34.8	1.6	0.5	121.9	25.3	7.7	26.5	26.6	1.4	0.5	98.6	66.9	12.8	30.4	43.0	1.7	0.6	144.6

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2019	27.1	24.1	31.0	19.7	0.7	1.1	103.9	14.2	16.8	28.8	14.6	0.7	1.1	87.5	40.4	31.4	33.1	24.7	0.8	1.1	120.3
Change [(2019–2018)/2018]																					
	-41%	136%	9%	-43%	-52%	109%	-15%														
Rank (descending) over 49 years (1971 to 2019)																					
	10	20	45	48	48	34	47														

Table 4.3.2.3. Estimated 2SW salmon returns (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Returns for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	10.0	4.1	75.5	59.6	17.1	NA	166.7	5.0	3.1	61.9	57.6	15.0	NA	151.0	17.1	5.2	89.0	61.7	19.2	NA	182.2
1971	14.5	3.6	43.2	34.8	13.5	0.7	110.6	7.1	2.6	35.5	32.6	11.9	0.6	98.2	24.5	4.6	51.0	37.0	15.2	0.7	123.7
1972	12.4	3.7	56.3	49.5	16.0	1.4	139.6	6.1	2.7	46.3	42.4	14.3	1.4	124.6	20.9	4.7	66.5	56.5	17.7	1.4	154.8
1973	17.3	4.6	62.1	47.6	12.9	1.4	146.5	8.5	3.5	51.0	40.6	11.7	1.4	129.0	29.3	5.8	73.4	54.7	14.1	1.4	164.9
1974	17.0	3.6	83.5	67.3	27.1	1.4	200.4	8.3	2.9	68.3	57.1	24.8	1.4	178.7	28.8	4.4	98.6	77.4	29.4	1.4	222.8
1975	15.9	5.2	70.8	42.9	28.9	2.3	166.4	7.8	3.9	58.1	36.6	26.3	2.3	148.6	26.8	6.5	83.6	49.2	31.5	2.4	184.9
1976	18.3	4.4	70.6	40.2	26.6	1.3	161.9	9.0	3.3	57.8	34.2	23.8	1.3	143.4	30.8	5.4	83.1	46.2	29.4	1.3	181.1
1977	16.2	3.6	83.1	80.6	32.3	2.0	218.4	8.0	2.9	68.1	69.0	28.9	2.0	196.1	27.5	4.2	98.0	92.2	35.7	2.0	240.9
1978	12.7	3.6	74.8	36.3	18.8	4.2	150.8	6.2	2.9	61.5	32.2	17.2	4.2	134.3	21.4	4.2	88.2	40.5	20.4	4.2	167.7
1979	7.2	1.7	41.3	12.0	10.5	1.9	75.0	3.6	1.3	33.8	10.6	9.4	1.9	65.9	12.2	2.1	48.6	13.5	11.6	2.0	84.3
1980	17.3	3.9	98.1	56.8	38.7	5.8	221.1	8.6	3.2	80.3	49.7	34.7	5.7	198.5	29.3	4.6	115.7	63.9	42.6	5.8	244.2
1981	15.6	7.0	77.2	24.4	23.2	5.6	153.5	7.7	5.5	63.2	20.4	20.8	5.6	135.2	26.4	8.6	90.9	28.3	25.6	5.7	171.8
1982	11.6	3.2	68.4	42.0	16.7	6.1	148.1	5.7	2.5	56.1	32.8	14.9	6.0	130.3	19.4	3.8	80.7	51.0	18.6	6.1	166.4
1983	8.3	3.7	56.2	31.2	16.5	2.2	118.4	4.1	3.0	46.1	25.7	14.5	2.1	105.0	14.1	4.4	66.2	36.8	18.5	2.2	131.6
1984	6.0	3.4	46.5	29.6	21.5	3.2	110.3	2.9	2.4	44.3	20.8	18.3	3.2	99.7	10.1	4.3	48.7	38.3	24.6	3.3	121.0
1985	4.7	2.7	48.1	35.9	29.7	5.5	126.9	2.3	1.9	45.3	25.2	25.4	5.5	114.5	8.0	3.6	51.0	46.7	34.0	5.6	139.6
1986	8.2	3.3	57.0	57.1	21.4	6.2	153.3	4.0	2.4	54.0	40.5	18.1	6.1	135.4	13.8	4.2	59.9	73.7	24.7	6.2	171.5
1987	11.0	2.4	53.6	35.6	13.6	3.1	119.7	5.4	1.7	51.1	25.7	11.6	3.1	107.1	18.6	3.0	56.2	45.8	15.7	3.1	132.8
1988	6.9	3.4	59.2	42.4	11.8	3.3	127.1	3.4	2.4	55.8	31.1	9.9	3.3	114.2	11.6	4.4	62.5	53.7	13.6	3.3	140.0
1989	6.7	1.7	53.8	28.0	14.6	3.2	108.2	3.3	1.2	51.1	20.6	12.4	3.2	99.0	11.2	2.1	56.5	35.5	16.9	3.2	117.6
1990	3.8	2.7	52.9	36.9	11.7	5.1	113.2	1.9	2.0	49.8	26.2	9.9	5.0	101.4	6.4	3.4	56.1	47.6	13.4	5.1	124.8
1991	1.9	2.1	47.7	35.7	13.0	2.6	103.0	0.9	1.6	45.0	24.6	11.1	2.6	91.4	3.1	2.5	50.4	46.8	15.0	2.7	114.8
1992	7.6	8.2	47.9	37.8	12.0	2.5	116.1	4.0	5.5	45.0	31.9	10.3	2.4	107.7	12.7	10.9	50.7	43.7	13.7	2.5	125.0
1993	9.4	4.4	36.8	43.3	8.1	2.2	104.6	5.9	3.2	35.5	23.1	7.2	2.2	83.6	15.1	5.5	38.1	63.3	9.0	2.3	125.4

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1994	12.9	4.0	37.2	30.2	5.2	1.3	91.4	8.5	2.9	35.9	23.9	4.7	1.3	82.7	20.3	5.2	38.5	36.6	5.7	1.4	100.9
1995	25.5	3.8	43.2	39.6	6.8	1.7	121.1	18.0	2.6	41.8	33.7	6.0	1.7	110.6	37.3	5.1	44.6	45.6	7.7	1.8	134.2
1996	18.8	5.7	39.1	29.3	9.2	2.4	104.9	13.4	4.1	37.5	22.9	8.1	2.4	95.6	27.7	7.3	40.8	35.5	10.3	2.4	115.6
1997	16.2	6.0	32.3	24.1	4.6	1.6	85.2	11.6	4.3	31.0	18.3	4.1	1.6	76.8	23.8	7.8	33.6	29.9	5.0	1.6	94.6
1998	8.8	6.5	24.8	16.3	2.6	1.5	60.5	5.2	4.5	23.4	12.8	2.4	1.5	54.8	12.5	8.4	26.1	19.9	2.8	1.5	66.3
1999	10.6	6.3	27.0	15.9	4.2	1.2	65.2	6.3	4.4	25.4	13.1	3.9	1.2	59.2	15.0	8.2	28.6	18.9	4.5	1.2	71.1
2000	14.4	6.4	25.8	17.1	2.4	0.5	66.6	8.5	4.5	23.7	14.1	2.2	0.5	59.3	20.5	8.2	27.9	20.1	2.6	0.5	74.1
2001	15.2	2.5	27.1	27.0	4.3	0.8	76.9	9.0	1.7	25.0	23.3	3.9	0.8	69.1	21.6	3.3	29.3	30.7	4.6	0.8	84.8
2002	11.1	2.4	19.3	14.0	1.0	0.5	48.3	6.4	1.6	17.6	11.5	0.9	0.5	42.6	15.9	3.3	21.0	16.6	1.0	0.5	54.2
2003	9.3	3.4	30.7	26.0	3.3	1.2	74.0	4.9	2.2	28.3	21.4	3.0	1.2	66.9	13.9	4.5	33.1	30.7	3.6	1.2	81.2
2004	11.1	3.3	26.5	25.5	2.7	1.3	70.4	7.5	2.1	24.7	20.3	2.5	1.3	63.6	14.9	4.6	28.4	30.7	2.9	1.3	77.4
2005	13.7	4.4	25.8	26.7	1.7	1.0	73.3	7.9	2.6	24.2	21.3	1.5	1.0	64.9	19.7	6.3	27.5	31.9	1.8	1.0	81.9
2006	13.7	5.4	23.9	22.8	2.5	1.0	69.5	8.7	3.6	22.3	18.4	2.3	1.0	62.0	19.2	7.2	25.5	27.3	2.8	1.0	77.0
2007	14.3	4.2	21.9	22.5	1.4	1.0	65.3	8.4	2.6	20.4	18.8	1.3	0.9	57.9	20.5	5.7	23.5	26.2	1.5	1.0	72.8
2008	17.2	3.9	26.3	18.9	3.1	1.8	71.0	10.4	2.4	24.0	14.7	2.7	1.7	62.4	24.2	5.3	28.6	23.1	3.4	1.8	79.9
2009	25.5	4.6	25.6	24.1	2.7	2.1	84.5	13.4	2.8	23.8	20.0	2.4	2.1	71.4	37.9	6.5	27.4	28.2	2.9	2.1	97.9
2010	12.3	4.7	27.6	20.3	2.0	1.1	67.9	7.5	3.1	25.8	16.3	1.8	1.1	60.9	17.1	6.2	29.5	24.4	2.2	1.1	74.9
2011	37.4	3.7	35.6	53.7	4.6	3.0	138.1	21.4	2.4	33.3	42.5	4.2	3.0	117.7	53.9	5.0	37.9	64.8	5.1	3.1	158.7
2012	22.0	2.3	25.2	19.7	1.1	0.9	71.1	13.4	1.6	23.5	16.1	1.0	0.9	61.5	30.8	3.0	27.0	23.3	1.2	0.9	81.1
2013	41.5	4.8	28.5	25.5	2.9	0.5	103.9	25.7	3.1	26.7	20.2	2.6	0.5	86.8	58.1	6.6	30.3	30.9	3.3	0.5	121.6
2014	40.2	2.9	16.2	17.5	0.7	0.3	77.8	25.1	1.9	15.2	13.7	0.6	0.3	62.0	55.9	3.8	17.2	21.3	0.8	0.3	94.1
2015	57.6	4.9	26.4	22.1	0.7	0.8	112.4	34.7	3.3	24.6	17.7	0.6	0.8	89.2	81.2	6.6	28.2	26.5	0.7	0.8	136.5
2016	46.8	3.7	28.2	26.4	1.5	0.4	107.2	25.7	2.4	26.2	20.4	1.4	0.4	84.9	68.6	5.1	30.3	32.5	1.7	0.4	130.0
2017	49.3	2.3	27.7	21.7	1.1	0.7	102.7	23.7	1.5	25.6	17.3	1.0	0.7	76.8	76.4	3.0	29.8	26.2	1.3	0.7	130.3
2018	29.9	1.6	20.8	28.5	1.4	0.5	82.9	16.4	1.0	19.4	21.6	1.3	0.5	67.2	43.9	2.2	22.2	35.5	1.6	0.5	98.9

Year	Median of estimated returns (X 1000)							5th percentile of estimated returns (X 1000)							95th percentile of estimated returns (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2019	17.6	3.0	22.6	14.8	0.7	1.1	59.9	9.2	1.9	21.1	10.7	0.6	1.1	50.0	26.4	4.2	24.2	18.8	0.8	1.1	70.0
% Change [(2019–2018)/2018]																					
	-41%	86%	9%	-48%	-51%	109%	-28%														
Rank (highest = 1 to lowest) over time-series (1971 to 2019)																					
	13	37	45	47	47	34	48														

Table 4.3.3.1. Estimated small salmon spawners (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Spawners for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	45.1	105.0	13.8	39.3	18.4	NA	NA	30.2	90.1	11.3	30.3	14.6	NA	NA	68.5	120.5	16.3	48.3	22.1	NA	NA
1971	60.5	92.0	11.7	32.7	12.2	0.0	209.9	40.7	78.9	9.6	25.5	9.3	0.0	183.3	91.4	105.5	13.8	39.7	15.0	0.0	243.9
1972	45.7	86.2	10.3	40.1	10.8	0.0	194.0	30.8	73.2	8.4	31.1	7.9	0.0	170.2	68.7	98.9	12.1	49.4	13.7	0.0	221.4
1973	6.5	124.4	13.7	45.6	18.3	0.0	208.6	1.9	106.4	11.3	36.6	14.7	0.0	187.1	12.3	142.0	16.2	54.5	22.0	0.0	230.1
1974	51.6	93.9	12.5	76.1	33.0	0.0	268.6	34.9	80.2	10.3	61.5	26.7	0.0	239.1	76.8	107.7	14.8	90.7	39.5	0.0	300.9
1975	98.5	117.5	14.6	67.2	26.2	0.1	325.7	67.5	99.5	11.9	54.6	22.8	0.1	283.9	148.5	135.5	17.1	80.1	29.6	0.1	379.4
1976	68.4	124.0	16.2	89.9	40.7	0.2	340.8	45.4	104.6	13.3	72.1	34.5	0.2	302.0	103.2	143.7	19.2	107.8	47.0	0.2	384.4
1977	60.9	125.3	15.0	24.8	32.1	0.1	259.4	41.0	105.6	12.3	18.6	26.2	0.1	227.7	92.3	144.9	17.7	31.0	38.0	0.1	296.6
1978	30.0	110.7	14.3	22.8	9.0	0.1	187.9	20.2	93.1	11.7	18.0	7.7	0.1	165.9	45.4	128.3	16.9	27.6	10.3	0.1	211.5
1979	38.2	120.7	19.8	49.7	36.5	0.2	266.6	25.2	101.9	16.3	40.1	29.9	0.2	238.7	58.8	139.7	23.4	59.2	43.1	0.2	296.3
1980	92.2	136.5	26.0	43.5	49.7	0.7	349.8	62.5	116.5	21.3	35.2	41.6	0.7	309.1	139.0	156.5	30.7	51.9	57.6	0.7	401.4
1981	101.1	179.1	38.6	70.2	40.3	1.0	432.1	67.4	150.9	31.8	49.3	31.9	1.0	378.6	152.6	206.7	45.6	90.7	48.7	1.0	494.4
1982	69.2	158.9	21.1	89.5	24.4	0.3	365.6	46.3	135.8	17.3	64.3	19.7	0.3	319.4	105.4	182.2	24.9	114.3	29.1	0.3	413.9
1983	41.7	124.0	15.0	23.7	14.8	0.3	220.8	27.3	105.4	12.3	16.2	12.0	0.3	193.7	64.0	143.1	17.7	31.4	17.6	0.3	250.5
1984	21.2	167.0	20.4	21.7	32.7	0.5	264.5	13.8	140.2	18.1	12.3	26.6	0.5	233.4	32.7	193.6	22.7	31.3	38.9	0.5	295.6
1985	40.0	158.8	20.1	60.2	36.2	0.4	317.0	26.7	132.0	17.6	42.2	28.9	0.4	278.4	61.2	186.4	22.6	77.9	43.5	0.4	356.8
1986	62.2	162.9	27.7	122.1	39.5	0.7	416.9	41.6	137.4	24.7	88.2	31.9	0.7	365.4	94.4	187.9	30.7	156.1	47.2	0.7	470.9
1987	76.4	111.0	32.8	90.7	41.1	1.1	355.2	50.8	93.9	29.0	65.8	33.1	1.1	310.8	117.2	128.0	36.5	115.4	49.0	1.1	404.9
1988	70.2	177.5	36.4	128.5	42.2	0.9	457.4	46.3	149.6	32.3	92.5	34.4	0.9	401.2	107.3	204.7	40.5	163.4	50.0	0.9	515.0
1989	47.3	89.1	30.7	69.8	43.5	1.1	283.2	31.0	76.6	27.6	48.2	35.4	1.1	248.7	72.6	102.0	33.9	91.6	51.6	1.1	319.7
1990	26.9	122.4	32.8	84.8	44.1	0.6	312.8	17.5	108.2	29.5	60.8	35.2	0.6	279.5	41.7	136.3	36.1	109.0	53.0	0.6	346.0
1991	22.0	85.1	25.2	66.9	22.3	0.2	222.5	14.3	75.9	22.7	49.2	18.6	0.2	199.2	34.3	94.2	27.8	84.5	26.0	0.2	246.1
1992	31.5	205.3	27.4	160.0	26.4	1.1	452.9	21.5	176.2	24.4	131.9	21.7	1.1	408.6	48.2	234.5	30.4	188.6	30.9	1.1	497.8

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1993	42.9	239.2	22.0	113.2	20.5	0.4	440.1	30.5	209.0	19.5	66.3	16.7	0.4	379.4	64.0	269.3	24.5	160.7	24.2	0.4	501.0
1994	31.1	129.6	20.7	45.2	9.1	0.4	237.3	22.3	107.5	18.4	35.5	8.0	0.4	210.4	45.4	152.1	23.1	55.1	10.2	0.4	265.2
1995	44.9	171.3	17.7	48.2	17.9	0.2	301.6	33.0	140.3	15.8	39.6	15.3	0.2	265.6	63.9	202.0	19.6	57.0	20.4	0.2	338.4
1996	87.0	274.8	23.2	35.4	28.2	0.7	451.8	64.8	230.4	20.8	28.9	23.9	0.6	398.8	124.5	319.1	25.6	41.9	32.5	0.7	508.1
1997	92.7	152.0	18.0	19.4	8.4	0.4	291.9	71.0	134.1	15.9	15.0	7.2	0.4	261.4	127.9	169.9	20.0	23.8	9.5	0.4	330.8
1998	149.0	158.3	21.2	25.9	19.9	0.4	374.7	100.4	145.9	18.7	21.4	18.3	0.4	324.3	197.3	170.7	23.7	30.6	21.6	0.4	424.9
1999	144.6	176.6	23.7	21.8	10.2	0.4	377.2	97.5	160.8	21.3	18.2	9.4	0.4	327.2	192.1	192.2	26.2	25.4	11.0	0.4	427.6
2000	178.9	204.7	21.1	31.7	12.0	0.3	448.2	120.6	192.7	18.0	26.8	11.0	0.3	388.9	236.7	216.8	24.1	36.6	13.0	0.3	507.9
2001	143.2	133.5	13.7	26.4	5.1	0.3	322.2	96.3	125.4	12.1	22.3	4.7	0.3	274.5	189.6	141.8	15.2	30.4	5.5	0.3	369.1
2002	100.4	132.9	21.3	43.9	9.5	0.5	308.6	63.7	120.5	19.1	36.9	8.7	0.4	268.8	136.1	145.2	23.6	50.9	10.4	0.5	347.3
2003	83.2	219.6	19.3	25.6	5.6	0.2	353.5	49.3	209.9	17.3	21.6	5.1	0.2	318.1	116.5	229.4	21.4	29.6	6.1	0.2	388.5
2004	92.6	188.4	26.3	49.2	8.1	0.3	364.8	70.0	170.4	22.8	40.9	7.4	0.3	333.9	115.4	206.5	29.8	57.6	8.9	0.3	396.0
2005	218.2	197.2	18.3	29.6	7.3	0.3	470.9	163.4	151.8	16.1	23.7	6.6	0.3	398.0	273.0	242.6	20.4	35.2	8.0	0.3	544.4
2006	211.5	191.0	21.6	37.8	10.0	0.5	472.6	138.0	172.2	19.4	30.4	9.1	0.4	396.0	284.5	209.5	23.8	45.2	11.0	0.5	548.0
2007	192.3	167.8	16.7	26.7	7.5	0.3	411.3	135.9	142.6	14.7	20.7	6.8	0.3	347.4	248.9	192.5	18.7	32.6	8.3	0.3	474.4
2008	201.5	217.6	26.7	40.9	15.1	0.8	503.0	146.6	191.8	23.7	30.7	13.6	0.8	440.2	256.3	243.2	29.7	51.0	16.6	0.8	565.4
2009	100.9	197.1	16.2	15.6	4.1	0.2	334.5	58.5	168.8	14.4	11.6	3.7	0.2	281.3	142.9	225.5	18.1	19.6	4.5	0.2	386.3
2010	120.2	235.2	20.5	47.4	14.8	0.5	438.0	80.9	223.5	18.2	40.3	13.3	0.5	396.9	158.9	246.7	22.9	54.5	16.3	0.5	480.5
2011	245.1	214.4	28.7	49.8	9.4	1.1	548.6	146.2	187.3	25.8	39.5	8.4	1.1	444.8	344.0	240.9	31.7	60.2	10.3	1.1	650.8
2012	172.3	246.6	18.3	11.5	0.6	0.0	449.5	110.8	226.9	16.1	8.5	0.5	0.0	384.7	233.1	266.8	20.4	14.5	0.6	0.0	513.3
2013	154.1	163.3	15.0	15.0	2.1	0.1	350.0	89.2	147.8	13.2	11.1	1.9	0.1	282.9	218.5	178.8	16.8	18.8	2.3	0.1	415.8
2014	266.2	146.0	18.7	10.8	1.4	0.1	443.4	182.9	131.0	16.6	8.3	1.3	0.1	359.4	348.4	160.8	21.0	13.5	1.5	0.1	526.8
2015	255.2	252.0	28.1	40.9	4.2	0.2	580.9	181.2	222.4	25.0	35.0	3.8	0.1	500.2	329.9	282.0	31.2	46.7	4.6	0.2	662.0
2016	202.6	159.9	26.3	25.1	2.5	0.2	416.8	117.7	135.3	23.1	19.8	2.3	0.2	327.7	288.8	185.0	29.4	30.4	2.8	0.2	506.7
2017	162.0	151.6	19.1	22.9	3.9	0.4	360.2	86.9	121.6	16.5	18.7	3.5	0.4	278.3	236.4	180.9	21.7	27.1	4.3	0.4	440.9
2018	284.7	85.3	18.2	19.1	1.3	0.3	409.2	177.5	73.9	16.0	15.2	1.2	0.3	301.5	392.0	97.0	20.3	22.9	1.4	0.3	516.5

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2019	116.1	154.4	16.0	18.7	3.5	0.4	309.0	66.5	121.4	13.9	14.9	3.2	0.4	247.6	164.1	188.3	18.1	22.5	3.8	0.4	370.0
Change [(2019–2018)/2018]																					
	-59%	81%	-12%	-2%	162%	23%	-24%														
Rank (highest = 1 to lowest) over time-series (1971 to 2019)																					
	18	27	39	45	44	20	34														

Table 4.3.3.2. Estimated large salmon spawners (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Spawners for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	9.5	12.8	39.1	11.9	7.9	NA	NA	4.4	9.7	32.0	9.6	5.6	NA	NA	16.5	15.8	46.1	14.1	10.2	NA	NA
1971	14.0	11.0	20.2	11.8	8.2	0.5	65.9	6.6	8.4	16.6	9.4	6.4	0.5	56.0	24.0	13.5	23.9	14.3	10.0	0.5	77.3
1972	12.0	11.3	39.6	33.4	12.0	1.0	109.4	5.7	8.7	32.5	25.5	10.1	1.0	95.8	20.4	13.8	46.8	41.2	13.9	1.0	123.7
1973	16.3	15.4	40.3	35.5	7.6	1.1	116.5	7.5	11.8	33.1	27.8	6.3	1.1	101.3	28.3	19.0	47.6	43.0	8.9	1.1	133.1
1974	16.2	13.1	49.1	55.8	15.2	1.1	151.0	7.5	11.5	40.2	44.4	12.9	1.1	132.5	28.0	14.7	57.9	67.3	17.5	1.2	170.1
1975	15.6	17.2	40.8	33.8	17.9	1.9	127.4	7.5	14.9	33.5	26.5	15.3	1.9	112.5	26.5	19.5	48.1	41.0	20.5	2.0	142.9
1976	17.5	15.6	38.7	29.2	17.0	1.1	119.4	8.1	13.6	31.8	22.1	14.1	1.1	104.3	29.9	17.6	45.7	36.3	19.8	1.1	135.8
1977	14.9	11.9	55.8	55.7	21.5	0.6	160.8	6.7	10.2	45.7	43.3	18.1	0.6	140.9	26.2	13.5	65.9	68.0	25.1	0.6	181.2
1978	12.0	9.8	51.1	19.4	10.9	3.3	106.8	5.5	8.8	42.0	14.7	9.2	3.3	93.5	20.6	10.8	60.4	24.2	12.6	3.3	120.8
1979	6.6	6.6	21.9	8.8	7.9	1.5	53.6	3.0	5.7	18.0	6.7	6.7	1.5	47.1	11.6	7.5	25.9	10.9	9.1	1.5	60.6
1980	16.4	10.1	61.0	34.3	23.9	4.3	150.7	7.7	9.2	50.0	26.9	19.8	4.2	132.7	28.4	11.1	72.0	42.1	28.1	4.3	169.3
1981	15.1	27.5	44.7	16.1	12.7	4.3	120.8	7.1	23.9	36.7	9.8	9.9	4.3	106.0	25.9	31.0	52.8	22.3	15.5	4.4	136.3
1982	10.9	10.3	45.3	27.0	10.4	4.6	109.0	5.1	8.8	37.2	15.8	8.3	4.6	92.2	18.8	11.9	53.5	38.3	12.6	4.7	125.7
1983	7.9	11.1	29.6	18.0	5.7	1.8	74.4	3.7	9.9	24.3	11.2	3.5	1.8	63.6	13.6	12.3	35.0	24.9	7.9	1.8	85.5
1984	5.5	11.9	37.1	28.4	20.0	2.5	105.7	2.4	8.6	34.1	19.3	16.7	2.5	94.0	9.6	15.2	40.1	37.7	23.4	2.6	117.5
1985	4.4	10.9	35.5	43.1	28.6	4.9	127.5	2.0	7.6	31.6	30.6	23.7	4.8	112.6	7.7	14.2	39.3	55.8	33.4	4.9	142.6
1986	7.7	12.2	40.7	66.3	24.9	5.6	157.6	3.5	9.3	36.6	47.1	20.5	5.5	136.1	13.3	15.0	44.6	85.6	29.3	5.6	179.2
1987	10.4	8.4	36.1	43.7	16.0	2.8	117.8	4.8	6.4	32.6	31.3	13.4	2.8	102.5	18.0	10.4	39.5	56.1	18.7	2.8	133.1
1988	6.2	12.9	43.1	51.7	14.8	3.0	132.0	2.7	9.8	38.5	37.7	12.1	3.0	116.1	10.9	16.0	47.8	65.7	17.5	3.1	148.0
1989	6.2	6.9	41.2	40.4	18.1	2.8	115.7	2.8	5.3	37.5	29.4	15.2	2.8	103.0	10.8	8.4	44.8	51.6	21.0	2.8	128.7
1990	3.5	10.2	40.9	54.8	15.3	4.4	129.2	1.5	8.3	36.6	38.0	12.7	4.3	111.2	6.1	12.2	45.3	71.5	17.8	4.4	147.2
1991	1.8	7.5	33.1	56.0	14.1	2.4	115.1	0.8	6.1	29.4	38.2	11.9	2.4	96.5	3.0	8.9	36.8	73.9	16.3	2.4	133.4
1992	6.8	31.4	32.3	58.1	13.0	2.3	144.1	3.2	22.0	28.5	49.5	11.0	2.3	129.9	11.9	40.7	36.2	66.7	14.9	2.3	158.4
1993	9.0	17.0	25.0	62.5	8.8	2.1	124.7	5.5	13.6	23.2	33.6	7.6	2.0	95.3	14.7	20.3	26.8	92.0	9.9	2.1	154.9

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1994	12.5	16.9	24.5	40.3	5.4	1.3	101.4	8.0	13.4	22.7	32.3	4.8	1.3	90.6	19.8	20.5	26.2	48.4	6.1	1.4	112.8
1995	25.0	18.6	34.6	47.4	7.1	1.7	134.9	17.6	14.2	32.7	40.5	6.2	1.7	122.9	36.8	22.9	36.5	54.4	8.0	1.8	149.2
1996	18.4	28.3	30.1	39.7	10.0	2.4	129.4	13.0	23.1	27.8	31.6	8.7	2.4	117.5	27.3	33.5	32.2	47.6	11.2	2.4	142.2
1997	16.0	27.6	24.8	34.5	4.9	1.6	109.9	11.4	22.5	23.0	27.1	4.3	1.6	99.0	23.5	32.6	26.7	42.0	5.5	1.6	121.3
1998	13.2	34.9	23.0	29.4	3.5	1.5	105.4	7.7	27.0	21.2	24.0	3.2	1.5	94.1	18.6	42.8	24.8	34.7	3.8	1.5	116.8
1999	15.8	31.8	27.9	26.0	4.4	1.2	107.0	9.1	24.6	25.7	21.8	4.1	1.2	96.1	22.2	38.9	30.1	30.2	4.8	1.2	118.0
2000	21.5	26.5	26.7	29.2	2.7	1.6	108.2	12.6	22.4	23.9	24.7	2.4	1.6	96.7	30.5	30.5	29.6	33.8	2.9	1.6	119.6
2001	22.8	17.5	27.5	38.5	4.4	1.5	112.1	13.3	14.8	24.9	33.6	4.0	1.5	100.3	32.2	20.2	30.1	43.4	4.8	1.5	123.6
2002	16.6	16.5	20.7	22.5	1.4	0.5	78.2	9.5	13.4	18.4	18.8	1.2	0.5	69.2	23.7	19.6	23.0	26.2	1.5	0.5	87.2
2003	13.9	24.1	33.8	38.7	3.3	1.2	115.0	7.1	19.1	30.5	32.4	3.0	1.2	103.6	20.6	29.1	37.1	45.0	3.6	1.2	126.2
2004	16.5	21.9	28.2	38.2	3.0	1.3	109.0	11.2	16.7	25.6	31.1	2.7	1.3	98.3	22.1	27.0	30.7	45.2	3.2	1.3	119.8
2005	20.6	28.0	28.1	36.9	1.9	1.1	116.3	11.7	20.0	25.8	29.8	1.7	1.1	102.0	29.4	35.8	30.4	43.9	2.1	1.1	130.7
2006	20.7	35.3	26.1	36.5	2.8	1.4	122.9	12.9	29.5	23.9	30.0	2.5	1.4	110.7	28.6	41.0	28.2	43.3	3.1	1.4	135.1
2007	21.5	29.3	23.6	33.5	1.5	1.2	110.6	12.5	23.1	21.5	28.2	1.3	1.2	98.0	30.5	35.5	25.7	38.8	1.6	1.2	123.0
2008	26.0	28.3	29.8	27.4	3.2	2.2	116.8	15.5	21.9	26.7	21.7	2.8	2.2	102.9	36.2	34.7	33.0	33.1	3.5	2.3	130.8
2009	38.9	34.0	28.7	34.9	3.0	2.3	141.8	20.4	23.6	26.3	29.3	2.7	2.3	118.9	57.6	44.7	31.1	40.5	3.3	2.3	165.2
2010	18.6	34.9	32.0	31.4	2.4	1.5	120.7	11.3	28.2	29.5	26.0	2.1	1.5	108.8	25.8	41.5	34.6	36.8	2.6	1.5	132.5
2011	57.5	42.8	40.7	65.1	4.7	3.9	214.8	32.8	30.8	37.5	52.1	4.2	3.9	183.1	82.1	54.7	43.8	78.3	5.2	3.9	246.4
2012	33.7	28.5	28.4	26.6	1.2	2.1	120.7	20.5	22.9	26.1	21.7	1.1	2.0	104.9	47.0	34.1	30.8	31.5	1.4	2.1	136.4
2013	63.8	37.3	32.4	34.4	3.1	5.3	176.2	39.3	25.5	29.9	27.1	2.8	5.2	147.4	88.5	49.1	34.8	41.6	3.5	5.3	205.4
2014	61.7	19.9	17.5	23.4	0.7	0.6	123.8	38.6	16.1	16.1	18.4	0.7	0.6	99.7	85.2	23.6	18.8	28.3	0.8	0.6	148.0
2015	88.7	36.3	30.6	32.8	0.7	1.5	190.9	53.6	28.6	28.2	26.7	0.7	1.5	154.1	123.8	44.1	33.0	38.9	0.8	1.5	227.5
2016	71.7	23.9	32.8	35.3	1.5	0.9	166.3	39.3	18.7	30.0	27.4	1.4	0.9	132.4	104.2	29.0	35.5	43.3	1.7	0.9	200.2
2017	75.7	22.2	32.7	27.5	1.2	1.5	160.7	36.2	17.2	29.9	22.0	1.1	1.4	120.6	116.6	27.3	35.6	33.0	1.3	1.5	202.2
2018	45.9	10.0	24.3	34.1	1.5	0.9	116.6	25.2	7.4	22.2	25.9	1.3	0.9	93.8	66.8	12.5	26.2	42.2	1.7	0.9	139.6

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2019	27.0	23.8	26.8	19.2	0.7	1.2	98.6	14.0	16.5	24.7	14.1	0.7	1.2	82.6	40.2	31.0	29.0	24.2	0.8	1.2	115.2
Change [(2019–2018)/2018]																					
	-41%	138%	10%	-44%	-53%	39%	-15%														
Rank (highest = 1 to lowest) over time-series (1971 to 2019)																					
	10	20	37	45	49	35	45														

Table 4.3.3.3. Estimated 2SW salmon spawners (medians, 5th percentile, 95th percentile; X 1000) to the six geographic areas and overall for NAC 1970 to 2019. Spawners for Scotia-Fundy (SF) do not include those from SFA 22 and a portion of SFA 23.

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1970	9.5	3.2	28.5	10.0	6.5	NA	NA	4.4	2.3	23.4	8.2	4.7	NA	NA	16.5	4.2	33.7	11.8	8.3	NA	NA
1971	14.0	3.0	14.8	10.4	7.1	0.5	49.8	6.6	2.1	12.1	8.3	5.6	0.5	41.1	24.0	3.9	17.4	12.6	8.5	0.5	60.4
1972	12.0	3.1	28.9	29.2	10.4	1.0	85.0	5.7	2.2	23.8	22.4	8.8	1.0	73.3	20.4	4.1	34.2	36.1	12.0	1.0	97.3
1973	16.3	3.8	29.4	32.2	6.7	1.1	89.9	7.5	2.8	24.2	25.4	5.5	1.1	76.5	28.3	4.9	34.7	39.1	7.9	1.1	105.0
1974	16.2	3.1	35.8	49.0	14.1	1.1	119.8	7.5	2.4	29.4	38.9	12.0	1.1	103.5	28.0	3.9	42.2	59.0	16.2	1.2	136.8
1975	15.6	4.7	29.8	28.8	16.4	1.9	97.5	7.5	3.4	24.4	22.6	13.9	1.9	84.4	26.5	6.0	35.1	35.1	18.9	2.0	111.5
1976	17.5	4.0	28.3	24.1	15.5	1.1	90.8	8.1	3.0	23.2	18.4	12.9	1.1	77.5	29.9	5.0	33.4	30.0	18.1	1.1	105.5
1977	14.9	2.8	40.7	51.3	18.8	0.6	129.7	6.7	2.2	33.4	40.1	15.7	0.6	112.2	26.2	3.3	48.1	62.7	22.0	0.6	148.1
1978	12.0	3.0	37.3	16.0	9.4	3.3	81.3	5.5	2.5	30.6	12.1	7.9	3.3	70.1	20.6	3.6	44.1	19.9	10.9	3.3	93.4
1979	6.6	1.6	16.0	5.8	6.7	1.5	38.3	3.0	1.2	13.1	4.4	5.6	1.5	32.9	11.6	2.0	18.9	7.1	7.7	1.5	44.4
1980	16.4	3.3	44.5	31.4	21.3	4.3	121.5	7.7	2.6	36.5	24.6	17.7	4.2	106.3	28.4	3.9	52.5	38.4	24.9	4.3	138.4
1981	15.1	6.6	32.6	9.8	10.4	4.3	79.0	7.1	5.1	26.8	5.8	8.2	4.3	67.1	25.9	8.1	38.5	13.7	12.5	4.4	92.2
1982	10.9	2.8	33.1	21.4	7.8	4.6	80.8	5.1	2.2	27.2	12.1	6.2	4.6	67.1	18.8	3.4	39.1	30.4	9.4	4.7	94.7
1983	7.9	3.3	21.6	14.0	4.2	1.8	53.0	3.7	2.7	17.7	8.5	2.6	1.8	44.1	13.6	3.9	25.5	19.4	5.7	1.8	62.2
1984	5.5	3.2	27.1	26.0	17.5	2.5	82.0	2.4	2.3	24.9	17.3	14.5	2.5	71.5	9.6	4.1	29.2	34.7	20.4	2.6	92.6
1985	4.4	2.7	25.9	34.9	24.6	4.9	97.7	2.0	1.9	23.0	24.2	20.5	4.8	85.2	7.7	3.6	28.7	45.7	28.7	4.9	110.1
1986	7.7	3.2	29.7	55.3	18.4	5.6	120.1	3.5	2.4	26.7	39.0	15.3	5.5	102.5	13.3	4.1	32.6	71.9	21.6	5.6	138.1
1987	10.4	2.3	26.3	33.8	12.2	2.8	88.2	4.8	1.6	23.8	23.8	10.2	2.8	75.5	18.0	3.0	28.9	43.7	14.2	2.8	100.9
1988	6.2	3.4	31.5	41.3	10.3	3.0	95.9	2.7	2.4	28.1	29.8	8.5	3.0	83.0	10.9	4.4	34.9	52.5	12.2	3.1	108.7
1989	6.2	1.7	30.0	26.8	14.3	2.8	82.0	2.8	1.2	27.4	19.3	12.1	2.8	72.7	10.8	2.1	32.7	34.3	16.5	2.8	91.3
1990	3.5	2.7	29.9	35.5	11.0	4.4	87.1	1.5	2.0	26.7	25.0	9.3	4.3	75.5	6.1	3.4	33.1	46.3	12.7	4.4	98.7
1991	1.8	2.0	24.2	34.8	11.7	2.4	76.9	0.8	1.6	21.5	23.8	9.8	2.4	65.3	3.0	2.5	26.9	45.9	13.5	2.4	88.6
1992	6.8	8.1	23.6	36.7	10.8	2.3	88.5	3.2	5.4	20.8	30.9	9.1	2.3	80.2	11.9	10.9	26.4	42.5	12.5	2.3	97.3

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
1993	9.0	4.3	18.2	42.5	6.9	2.1	83.6	5.5	3.2	16.9	22.5	6.0	2.0	62.6	14.7	5.4	19.6	62.6	7.8	2.1	104.2
1994	12.5	3.9	17.9	29.6	4.4	1.3	69.9	8.0	2.8	16.6	23.3	3.9	1.3	61.5	19.8	5.0	19.1	35.8	4.9	1.4	79.3
1995	25.0	3.7	25.3	39.0	6.5	1.7	101.6	17.6	2.5	23.9	33.0	5.6	1.7	91.1	36.8	5.0	26.7	44.9	7.3	1.8	114.6
1996	18.4	5.5	21.9	28.4	8.4	2.4	85.5	13.0	3.9	20.3	22.2	7.3	2.4	76.3	27.3	7.1	23.5	34.7	9.4	2.4	96.2
1997	16.0	5.9	18.1	23.2	4.0	1.6	69.2	11.4	4.1	16.8	17.4	3.5	1.6	60.9	23.5	7.6	19.5	29.0	4.4	1.6	78.7
1998	8.6	6.4	16.8	15.9	2.3	1.5	51.4	5.0	4.4	15.5	12.4	2.1	1.5	45.7	12.3	8.3	18.1	19.4	2.5	1.5	57.2
1999	10.3	6.2	20.4	15.1	3.7	1.2	56.9	6.0	4.3	18.8	12.2	3.5	1.2	51.0	14.7	8.1	22.0	18.0	4.0	1.2	62.8
2000	14.1	6.2	19.5	16.5	2.2	1.6	60.1	8.2	4.4	17.4	13.6	2.0	1.6	52.8	20.2	8.0	21.6	19.5	2.4	1.6	67.6
2001	14.9	2.4	20.1	26.1	4.0	1.5	68.9	8.7	1.7	18.2	22.4	3.7	1.5	61.3	21.3	3.2	22.0	29.7	4.4	1.5	76.7
2002	10.9	2.4	15.1	13.5	0.8	0.5	43.1	6.2	1.6	13.5	11.0	0.7	0.5	37.4	15.7	3.2	16.8	16.0	0.9	0.5	49.0
2003	9.1	3.3	24.6	25.3	3.1	1.2	66.6	4.6	2.2	22.3	20.6	2.8	1.2	59.5	13.6	4.4	27.1	29.8	3.4	1.2	73.8
2004	10.8	3.3	20.6	24.7	2.6	1.3	63.2	7.3	2.0	18.7	19.6	2.4	1.3	56.4	14.7	4.5	22.4	29.8	2.8	1.3	70.0
2005	13.4	4.3	20.5	25.7	1.6	1.1	66.7	7.6	2.5	18.8	20.5	1.4	1.1	58.1	19.4	6.2	22.2	30.9	1.7	1.1	75.1
2006	13.5	5.3	19.0	22.1	2.4	1.4	63.7	8.4	3.5	17.5	17.6	2.1	1.4	56.4	18.9	7.1	20.6	26.4	2.6	1.4	71.2
2007	14.1	4.1	17.2	21.6	1.3	1.2	59.5	8.2	2.6	15.7	17.9	1.2	1.2	52.0	20.2	5.6	18.8	25.3	1.4	1.2	67.1
2008	17.0	3.8	21.8	18.1	3.0	2.8	66.3	10.2	2.4	19.5	13.9	2.6	2.8	57.7	23.9	5.2	24.1	22.2	3.3	2.8	75.1
2009	25.2	4.6	21.0	23.2	2.5	2.3	78.8	13.2	2.7	19.2	19.1	2.3	2.3	65.7	37.7	6.4	22.7	27.3	2.8	2.3	92.3
2010	12.1	4.6	23.4	19.4	1.9	1.5	62.8	7.3	3.1	21.5	15.5	1.7	1.5	55.9	16.9	6.1	25.2	23.4	2.1	1.5	69.8
2011	37.2	3.6	29.7	52.2	4.6	3.9	131.1	21.3	2.4	27.4	41.2	4.1	3.8	110.9	53.7	4.9	32.0	63.1	5.0	3.9	151.7
2012	21.9	2.3	20.8	18.9	1.0	2.0	66.9	13.3	1.6	19.0	15.4	0.9	2.0	57.2	30.8	3.0	22.5	22.5	1.1	2.0	76.9
2013	41.3	4.8	23.6	24.5	2.9	5.2	102.2	25.5	3.0	21.8	19.1	2.6	5.2	85.2	57.9	6.5	25.4	29.7	3.3	5.3	120.2
2014	40.1	2.8	12.7	17.1	0.7	0.6	74.0	25.0	1.9	11.8	13.3	0.6	0.6	58.3	55.8	3.8	13.7	20.9	0.7	0.6	90.3
2015	57.5	4.8	22.4	21.6	0.7	1.5	108.5	34.7	3.2	20.6	17.2	0.6	1.5	85.2	81.1	6.5	24.1	26.0	0.7	1.5	132.6
2016	46.6	3.6	23.9	25.9	1.5	0.9	102.3	25.5	2.3	21.9	19.9	1.3	0.9	80.2	68.4	4.9	25.9	31.9	1.6	0.9	125.2
2017	49.1	2.2	23.9	21.2	1.1	1.4	99.0	23.5	1.5	21.8	16.8	1.0	1.4	72.9	76.2	2.9	26.0	25.6	1.2	1.5	126.5
2018	29.8	1.6	17.7	28.1	1.4	0.9	79.4	16.3	1.0	16.2	21.1	1.3	0.9	63.9	43.8	2.2	19.2	34.9	1.6	0.9	95.4

Year	Median of estimated spawners (X 1000)							5th percentile of estimated spawners (X 1000)							95th percentile of estimated spawners (X 1000)						
	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC	LAB	NF	QC	GF	SF	US	NAC
2019	17.5	3.0	19.5	14.4	0.7	1.2	56.4	9.0	1.8	18.0	10.3	0.6	1.2	46.7	26.3	4.2	21.1	18.5	0.7	1.2	66.5
Change [(2019–2018)/2018]																					
	-41%	89%	10%	-49%	-52%	39%	-29%														
Rank (highest = 1 to lowest) over time-series (1971 to 2019)																					
	12	34	37	44	47	35	44														
2SW CL																					
	34.7	4.0	32.1	18.7	24.7	29.2															
% 2SW CL attained in most recent year (2019)																					
	50%	75%	61%	77%	3%	4%															
2SW management objective																					
					11.0	4.5															
% 2SW management objective attained in most recent year (2019)																					
					6%	27%															

Table 4.3.4.1. Time-series of stocks in Canada and the USA with established CLs the number of rivers assessed and the number and percent of assessed rivers meeting CLs 1991 to 2019. In 2016, Québec implemented a new Atlantic salmon management plan which changed their river-specific LRP values (Dionne *et al.*, 2015) and DFO Gulf Region revised the river-specific reference points in 2018 (DFO 2018).

Year	Canada				USA			
	No. CLs	No. assessed	No. met	% met	No. CLs	No. assessed	No. met	% met
1991	74	64	34	53				
1992	74	64	38	59				
1993	74	69	30	43				
1994	74	72	28	39				
1995	74	74	36	49	33	16	0	0
1996	74	76	44	58	33	16	0	0
1997	266	91	38	42	33	16	0	0
1998	266	83	38	46	33	16	0	0
1999	269	82	40	49	33	16	0	0
2000	269	81	31	38	33	16	0	0
2001	269	78	29	37	33	16	0	0
2002	269	80	21	26	33	16	0	0
2003	269	79	33	42	33	16	0	0
2004	269	75	39	52	33	16	0	0
2005	269	70	31	44	33	16	0	0
2006	269	65	29	45	33	16	0	0
2007	269	61	23	38	33	16	0	0
2008	269	68	29	43	33	16	0	0
2009	375	70	32	46	33	16	0	0
2010	375	68	31	46	33	16	0	0
2011	458	75	50	67	33	16	0	0
2012	472	74	32	43	33	16	0	0
2013	473	75	46	61	33	16	0	0
2014	476	69	20	29	33	16	0	0
2015	476	74	43	58	33	16	0	0
2016	476	62	41	66	33	16	0	0
2017	476	68	42	62	33	16	0	0
2018	498	70	38	54	33	16	0	0
2019	498	71	41	58	33	16	0	0

Table 4.3.5.1. Return rates (%) by year of smolt migration of wild Atlantic salmon to 1SW (or small) salmon to North American rivers 1991 to 2018 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for the island of Newfoundland.

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld						
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SWMiramcihi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands	Conne	Rocky	NE Trepassey	Campbellton	Garnish	WAB
1991										0.6	0.5	1.2	1.6		3.4	3.1	2.6			3.6
1992										0.5	0.4	1.3	0.8		4.0	3.7	4.7			6.1
1993										0.4	0.3	0.9	0.7	1.5	2.7	3.1	5.4	9.0		7.1
1994											0.3	1.2	0.6	1.6	5.8	3.9	8.5	7.3		8.9
1995											0.6	1.4	0.9	1.6	7.2	4.7	9.2	8.1		8.1
1996			1.5								0.3		0.6	3.2	3.4	3.1	2.9	3.4		3.5
1997	0.04		4.3										1.7	1.4	2.9	2.5	5.0	5.3		7.2
1998	0.21	2.9	2.0								0.3		1.4	2.5	3.4	2.7	4.9	6.1		6.1
1999	0.31	1.8	4.8				3.0				0.3		0.4	0.6	8.1	3.2	5.9	3.8		11.1
2000	0.28	1.5	1.2				4.9				0.5		0.3	0.6	2.5	3.1	3.2	6.0		4.4
2001	0.16	3.1	2.7				6.6	8.6	7.9		0.5		0.6		3.0	2.9	7.1	5.3		9.2

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld						
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SWMiramcihi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands	Conne	Rocky	NE Trepassey	Campbellton	Garnish	WAB
2002	0.00	1.9	2.0			1.5	2.4	3.0	3.0		0.6		0.9		2.4	4.0	5.5	6.8		9.4
2003	0.08	6.4	1.8			1.6	4.1	6.8	5.9		0.6		0.6		5.3	3.8	6.6	7.8		9.5
2004	0.08	5.1	1.1			0.9	2.6	1.8	2.0		0.7		1.0		2.5	3.3	4.4	11.4		5.9
2005	0.24	12.7	8.0	3.0		1.1	3.6				0.4		1.5		4.0	2.2	5.5	9.2		15.1
2006	0.09	1.8	1.5	0.7		0.7	1.4	1.5	1.5		0.3				3.3	1.3	2.7	5.6		3.8
2007	0.35	5.6	2.3	2.2		1.3		1.6			0.4		1.5		4.4	5.6	5.5	11.2		11.6
2008	0.22	3.9	1.2	0.6		0.3		1.0			0.6		0.7		2.4	2.7	2.6	8.8		6.1
2009	0.26	12.4	3.5			1.0		3.3			0.8		1.9		2.5	6.8	4.9	9.5		9.6
2010	0.95	7.9	1.8					1.5			0.7		2.5		2.7	5.1	5.6	11.0		7.1
2011	0.32	0.3									0.4		0.6		3.9	4.6	3.0	9.7		5.7
2012	0.00	1.6									0.4		0.4		5.3	3.7	4.0	9.3		5.2
2013	0.26	1.6	0.6		0.2						0.9		0.6		1.9	5.3		10.0		7.2
2014	0.32	2.9	0.6		0.4						0.9		1.9		4.1			8.8		8.2

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld						
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SWMiramcihi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands	Conne	Rocky	NE Trepassey	Campbellton	Garnish	WAB
2015	0.09	5.0	0.4		0.2								1.2		3.6			8.4		9.4
2016		2.8	0.7		1.1						0.2		0.5			7.7		3.7		5.7
2017											0.8		0.7		0.8	6.2		8.5	2.8	9.3
2018											0.5		0.4			15.5		7.0	2.5	3.4

Table 4.3.5.2. Return rates (%) by year of smolt migration of wild Atlantic salmon to 2SW salmon to North American rivers 1991 to 2017 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for the island of Newfoundland.

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SW Miramchi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands
1991										0.6	0.9	0.4	0.6	
1992										0.5	0.7	0.4	0.5	
1993										0.4	0.8	0.9	0.7	1.2
1994											0.9	1.5	0.7	1.4
1995											0.9	0.4	0.5	1.3
1996			0.2								0.4		0.5	0.9
1997	0.87		0.4										1.1	1.2
1998	0.28	0.7	0.3								0.4		0.7	1.1
1999	0.53	0.8	0.9				1.2				0.7		0.2	0.7
2000	0.17	0.3	0.1				0.5				1.2		0.1	0.7
2001	0.85	0.9	0.6				0.6	3.3	2.3		0.9		0.3	
2002	0.58	1.3	0.5			6.2	0.7	1.4	1.3		0.9		0.5	

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SW Miramcihi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands
2003	1.01	1.6	0.2			3.9	0.9	2.0	1.6		1.4		0.2	
2004	0.98	1.3	0.3			3.0	0.5	0.8	0.7		1.1		0.7	
2005	0.73	1.5	0.5	0.3		2.3	1.1				0.6		0.5	
2006	0.74	0.6	0.4	0.1		3.0	0.2	0.5	0.4		0.5			
2007	2.07	1.3	0.2	0.1		2.1		0.8			0.5		0.3	
2008	0.65	2.1	0.3			2.4		0.7			1.8		0.5	
2009	1.80	3.3	0.9			5.7		2.2			1.9		0.8	
2010	0.24	0.4	0.2								1.0		0.6	
2011	0.56	1.0									1.7		0.3	
2012	1.02	0.3									0.6		0.1	
2013	1.91	0.5	0.2		1.7						1.9		0.3	
2014	0.51	0.6	0.2		1.5						1.2		0.6	
2015	0.62	1.2	0.4		2.0								0.4	

SMOLT YEAR	USA	Scotia-Fundy				Gulf				Québec				Nfld
	Narraguagus	Nashwaak	LaHave	StMary's	Middle	Margaree	NWMiramichi	SW Miramcihi	Miramichi	à la barbe	Saint Jean	Bec scie	de la Trinite	Highlands
2016		0.4	0.2		2.2						0.7		0.2	
2017											1.9		0.3	

Table 4.3.5.3. Return rates (%) by year of smolt migration of hatchery Atlantic salmon to 1SW salmon to North American rivers 1991 to 2018 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for Newfoundland.

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
1991	0.00	0.14	0.01	0.69	4.51	0.15	0.50	3.16			0.48	0.43
1992	0.00	0.04	0.00	0.41	1.26	0.21	0.42	1.43	0.44	2.16	0.70	0.07
1993	0.00	0.05	0.00	0.39	0.62	0.32	0.56	0.14	0.37		0.02	0.10
1994	0.00	0.03	0.00	0.66	1.44	0.36	0.35	5.20	0.11		0.08	0.02
1995		0.08	0.02	1.14	2.26	0.37	0.64					0.07
1996		0.04	0.02	0.56	0.47	0.07	0.17					0.31
1997		0.04	0.02	0.75	0.87	0.03	0.15					0.46
1998		0.04	0.09	0.47	0.34	0.05	0.10					1.04
1999		0.03	0.05	0.46	0.79	0.23						0.32
2000	0.00	0.04	0.01	0.27	0.43	0.03						1.15
2001		0.07	0.06	0.45	0.87							0.02
2002		0.04	0.02	0.34	0.63							0.07

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
2003	0.00	0.05	0.03	0.32	0.72							
2004	0.00	0.05	0.02	0.39	0.53							
2005	0.02	0.06	0.02	0.56								
2006	0.00	0.04	0.02	0.24								
2007	0.01	0.13	0.01	0.83								
2008	0.00	0.03	0.00	0.13								
2009	0.00	0.07	0.03	1.44								
2010	0.01	0.12	0.18	0.12								
2011	0.00	0.00	0.00	0.02								
2012		0.01	0.00	0.67								
2013		0.02	0.01	0.11								
2014		0.02		0.24								
2015		0.06		0.11								

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
2016		0.05		0.54								
2017		0.05		0.25								
2018		0.05		0.15								

Table 4.3.5.4. Return rates (%) by year of smolt migration of hatchery Atlantic salmon to 2SW salmon to North American rivers 1991 to 2017 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for Newfoundland.

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
1991	0.04	0.19	0.02	0.15	0.48	0.00	0.05	0.04			0.00	0.13
1992	0.08	0.08	0.00	0.22	0.24	0.01	0.03	0.07	0.00	0.05	0.06	0.06
1993	0.04	0.19	0.03	0.19	0.21	0.02	0.03	0.31	0.91		0.01	0.19
1994	0.04	0.22	0.05	0.27	0.23	0.06	0.02					0.05
1995		0.16	0.06	0.19	0.23	0.00	0.03					0.04
1996		0.14	0.09	0.08	0.13	0.01						0.07
1997		0.10	0.11	0.20	0.17	0.01						0.08
1998		0.05	0.06	0.06	0.11	0.00						0.09
1999		0.08	0.13	0.16	0.21	0.00						0.02
2000	0.01	0.06	0.03	0.05	0.07							0.01
2001		0.16	0.26	0.15	0.13							0.02
2002		0.17	0.18	0.11	0.17							

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
2003	0.00	0.12	0.05	0.06	0.09							
2004	0.03	0.12	0.13	0.09	0.11							
2005	0.02	0.10	0.10	0.12								
2006	0.02	0.23	0.15	0.06								
2007	0.02	0.30	0.08	0.17								
2008	0.01	0.15	0.05	0.16								
2009	0.04	0.39	0.17	0.13								
2010	0.00	0.09	0.11	0.07								
2011	0.01	0.05	0.02	0.02								
2012		0.03	0.08	0.10								
2013		0.10	0.02	0.02								
2014		0.04		0.09								
2015		0.12		0.04								

SMOLT YEAR	USA			Scotia Fundy				Gulf				Québec
	Connecticut	Penobscot	Merrimack	Saint John	LaHave	East Sheet	Liscomb	Morell	Mill	West	Valley-field	auxRochers
2016		0.08		0.00								
2017		0.13		0.00								

Table 4.3.6.1. Estimates (medians, 5th percentiles, 95th percentiles; X 1000) of Pre-fishery Abundance (PFA) for 1SW maturing salmon (PFA1SWmat) 1SW non-maturing salmon (PFA1SWnonmat) and the total cohort of 1SW salmon (PFA1SWcohort) as of 1 August of the second summer at sea for NAC for the years of Pre-fishery Abundance 1971 to 2019.

Year	Median of estimated PFA (X 1000)			5th percentile of estimated PFA (X 1000)			95th percentile of estimated PFA (X 1000)		
	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat
1971	1240.0	702.8	535.8	1171.0	640.2	500.5	1310.0	766.9	576.2
1972	1257.0	723.6	532.4	1200.0	670.2	503.0	1319.0	783.4	564.9
1973	1570.0	902.5	667.1	1487.0	820.5	637.0	1654.0	986.4	697.8
1974	1512.0	812.0	699.5	1446.0	750.6	662.0	1584.0	878.6	739.1
1975	1705.0	905.3	798.1	1628.0	839.8	746.4	1791.0	975.2	860.7
1976	1635.0	836.1	798.3	1556.0	765.5	750.9	1721.0	911.6	849.8
1977	1305.0	667.4	636.2	1236.0	607.2	594.5	1376.0	731.5	682.4
1978	808.0	396.9	410.7	770.9	368.4	382.9	846.0	426.5	439.3
1979	1428.0	837.3	589.6	1355.0	771.7	557.5	1505.0	908.1	623.7
1980	1545.0	711.5	832.5	1475.0	655.1	781.8	1621.0	772.1	892.1
1981	1580.0	667.2	911.6	1507.0	621.6	850.2	1659.1	716.4	983.3
1982	1327.0	560.7	765.8	1268.0	523.8	716.3	1390.0	599.8	819.8
1983	846.6	334.6	511.5	805.5	305.0	480.1	889.6	366.8	545.1
1984	892.1	353.0	539.1	846.8	321.6	504.8	939.4	386.8	572.5
1985	1184.0	526.5	657.0	1125.0	483.5	614.9	1245.0	572.7	699.6
1986	1393.0	559.5	833.2	1322.0	512.4	778.0	1467.0	608.9	892.3
1987	1310.0	508.9	800.5	1250.0	472.5	747.9	1373.0	548.3	856.5
1988	1263.0	414.7	848.1	1197.0	382.1	788.7	1332.0	448.5	910.2
1989	921.0	326.5	593.9	875.3	298.5	556.1	968.9	357.0	634.5
1990	850.9	289.8	560.7	807.3	265.4	525.5	896.0	317.1	596.5
1991	737.0	322.1	414.7	703.1	300.1	389.2	772.2	346.3	440.0
1992	787.2	210.3	576.3	730.2	178.4	531.0	846.4	245.3	623.0

Year	Median of estimated PFA (X 1000)			5th percentile of estimated PFA (X 1000)			95th percentile of estimated PFA (X 1000)		
	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat
1993	694.8	149.9	544.6	628.8	133.0	481.6	762.3	169.3	607.5
1994	513.7	185.5	328.0	477.3	164.1	299.7	552.7	210.5	356.7
1995	563.4	182.5	380.7	521.2	163.9	344.0	608.0	203.8	418.4
1996	710.7	154.9	555.6	653.0	139.2	501.1	771.6	172.9	613.2
1997	468.6	106.8	361.4	434.1	96.1	329.8	510.8	118.7	402.0
1998	540.2	98.4	441.7	485.6	87.3	388.9	595.0	110.7	493.9
1999	546.0	103.6	442.2	490.1	90.6	389.2	601.2	117.9	494.5
2000	641.5	117.8	523.9	577.2	103.7	461.5	706.2	133.6	585.2
2001	467.3	81.3	386.0	416.3	71.6	336.7	518.3	92.1	434.7
2002	496.0	110.7	385.1	451.6	97.6	343.7	540.0	125.1	426.0
2003	528.1	107.6	420.4	487.0	94.9	382.9	568.6	121.6	457.1
2004	559.0	112.2	446.6	522.1	97.6	413.9	597.1	128.2	479.7
2005	655.0	107.3	547.7	577.5	94.1	471.6	732.9	121.8	623.4
2006	652.3	101.5	550.9	572.0	88.8	472.3	733.1	116.0	629.3
2007	586.1	113.5	472.2	517.4	98.9	406.7	653.3	129.8	536.8
2008	729.1	133.0	595.7	658.7	112.1	530.5	798.9	155.8	660.7
2009	505.2	109.1	395.8	448.4	96.5	341.3	561.7	123.0	450.7
2010	742.9	211.2	531.3	685.3	178.6	487.1	801.0	246.8	575.0
2011	759.3	114.1	644.6	650.6	98.3	538.3	868.6	131.8	752.2
2012	676.9	163.7	512.6	602.5	136.9	445.2	752.0	194.0	579.5
2013	537.5	127.1	410.0	462.2	103.5	341.4	612.7	153.4	478.9
2014	685.1	180.3	504.3	587.9	144.9	417.7	782.2	218.8	589.8
2015	827.6	172.4	654.5	734.8	139.4	570.8	920.8	209.0	738.5
2016	641.2	158.0	482.1	537.6	120.0	390.0	745.1	201.2	574.2

Year	Median of estimated PFA (X 1000)			5th percentile of estimated PFA (X 1000)			95th percentile of estimated PFA (X 1000)		
	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat	PFA1SWcohort	PFA1SWnmat	PFA1SWmat
2017	535.1	127.9	407.1	447.2	104.3	323.4	624.1	154.1	490.8
2018	551.7	103.9	447.2	439.2	88.5	336.4	663.4	121.0	558.0
2019	NA	NA	350.1	NA	NA	286.4	NA	NA	412.8
Prev. 5-year mean	648.1	148.5	468.2						
Change (recent year relative to previous year)									
	3%	-19%	-22%						
Change (recent year relative to previous 5-year mean)									
	-15%	-30%	-25%						
Rank (highest = 1 to lowest) over time-series (1971 to most recent year)									
	38 / 48	44 / 48	48 / 49						

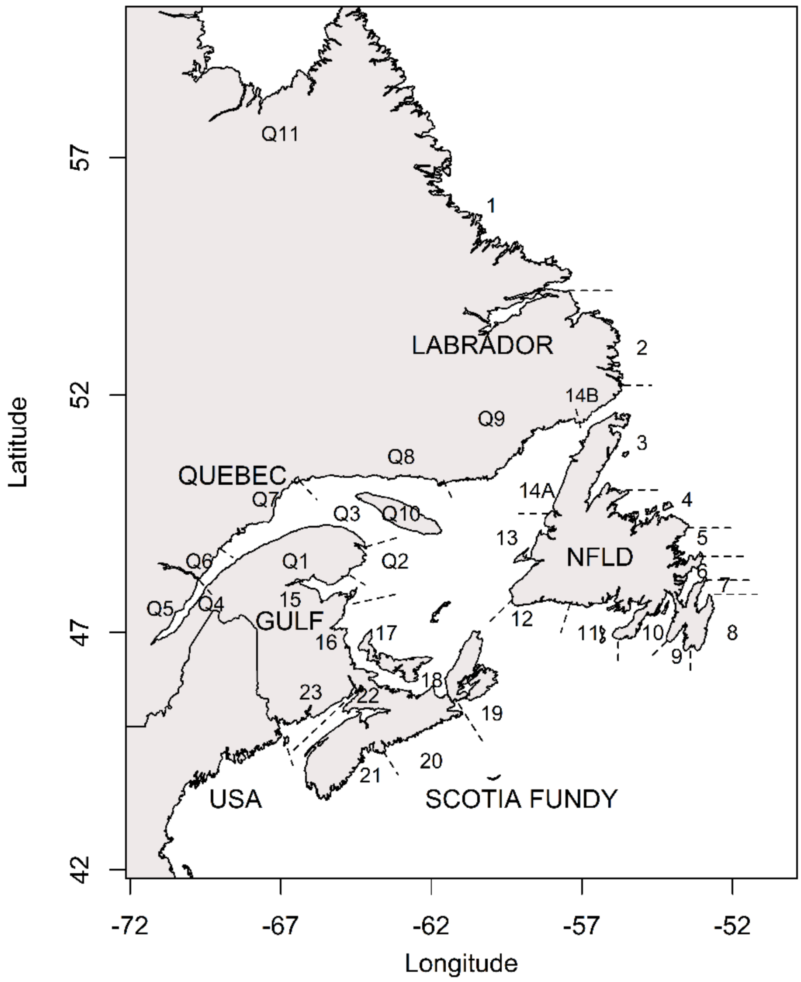


Figure 4.1.2.1. Map of Salmon Fishing Areas (SFAs) and Québec Management Zones (Qs) in Canada.

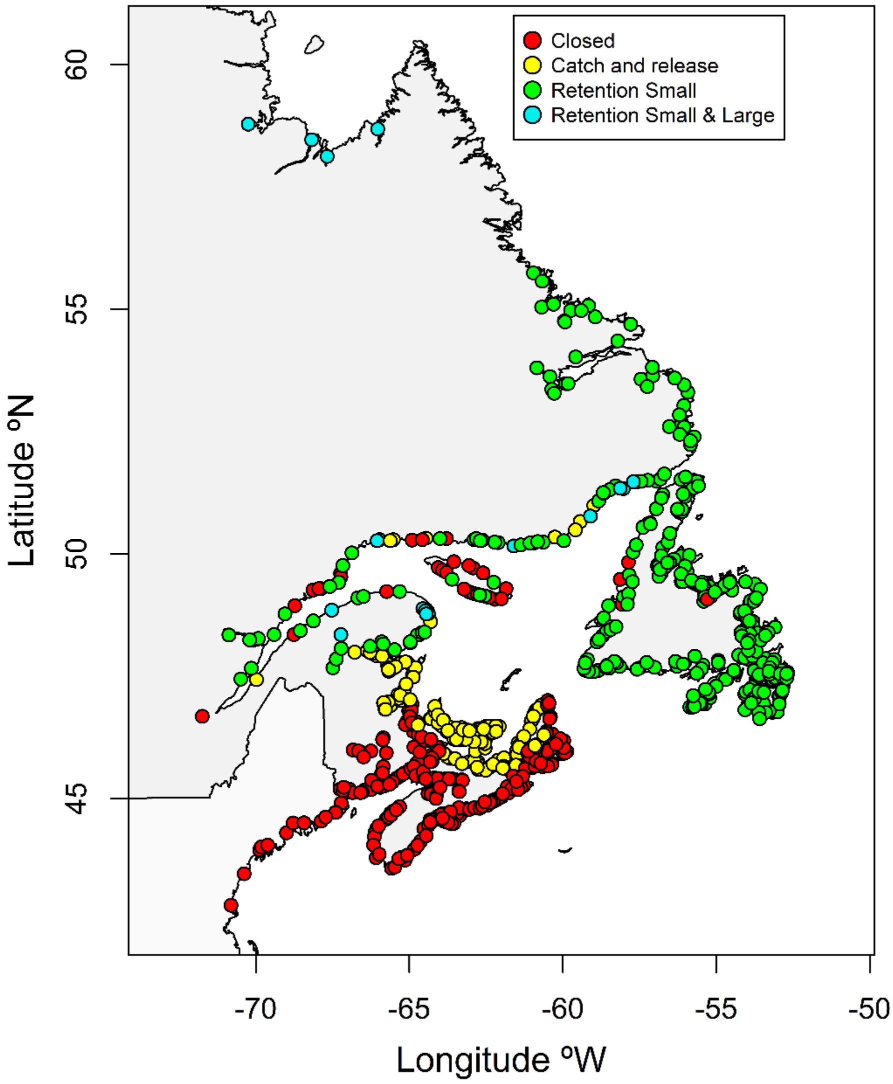


Figure 4.1.2.2. Summary of recreational fisheries management measures in Canada in 2019. Note: details on specific regions are available in the text and may not appear on the figure.

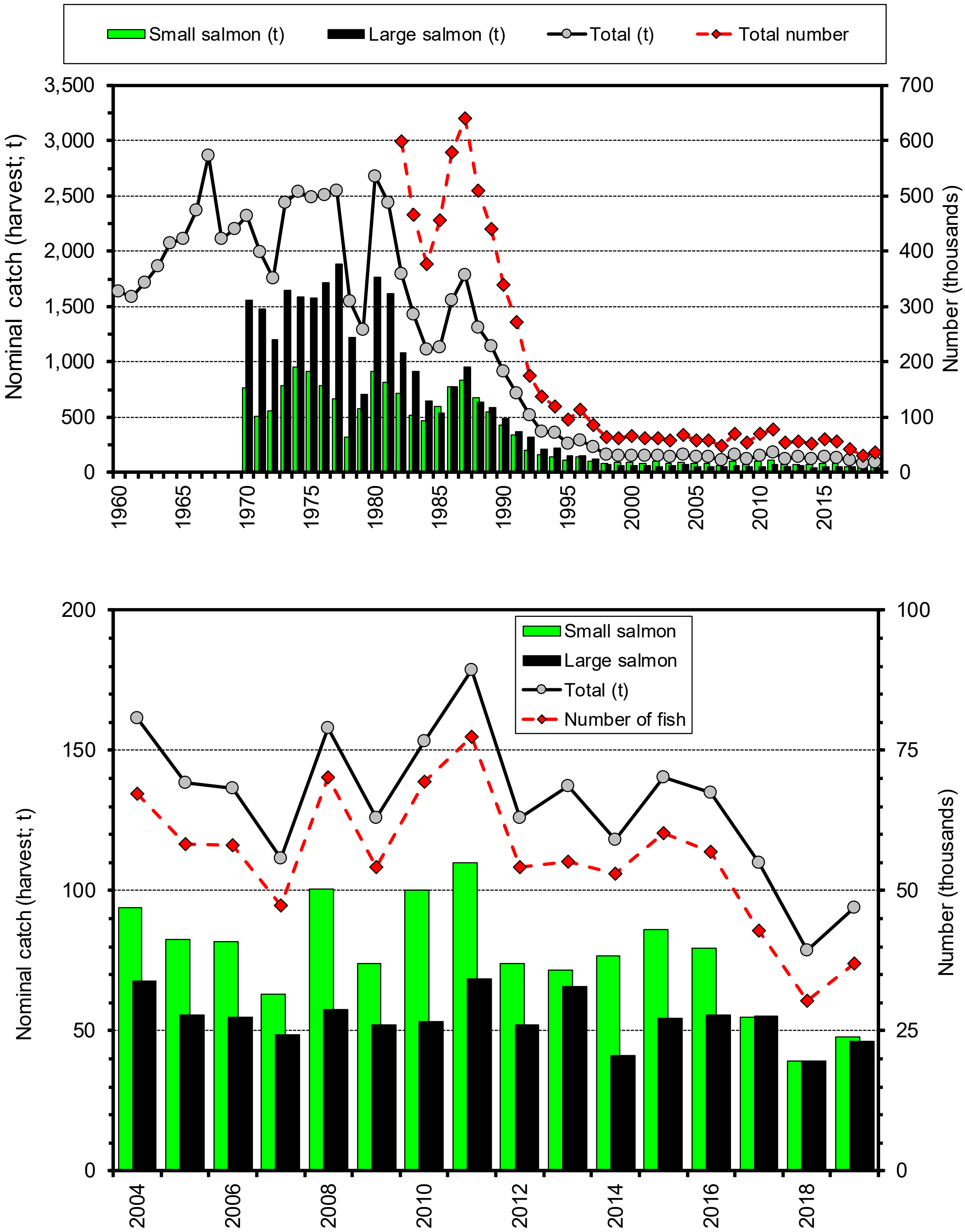


Figure 4.1.3.1. Nominal catch (harvest; t) of small salmon, large salmon and both sizes combined (weight and number) for Canada, 1960 to 2019 (top panel) and 2004 to 2019 (bottom panel) by all users.

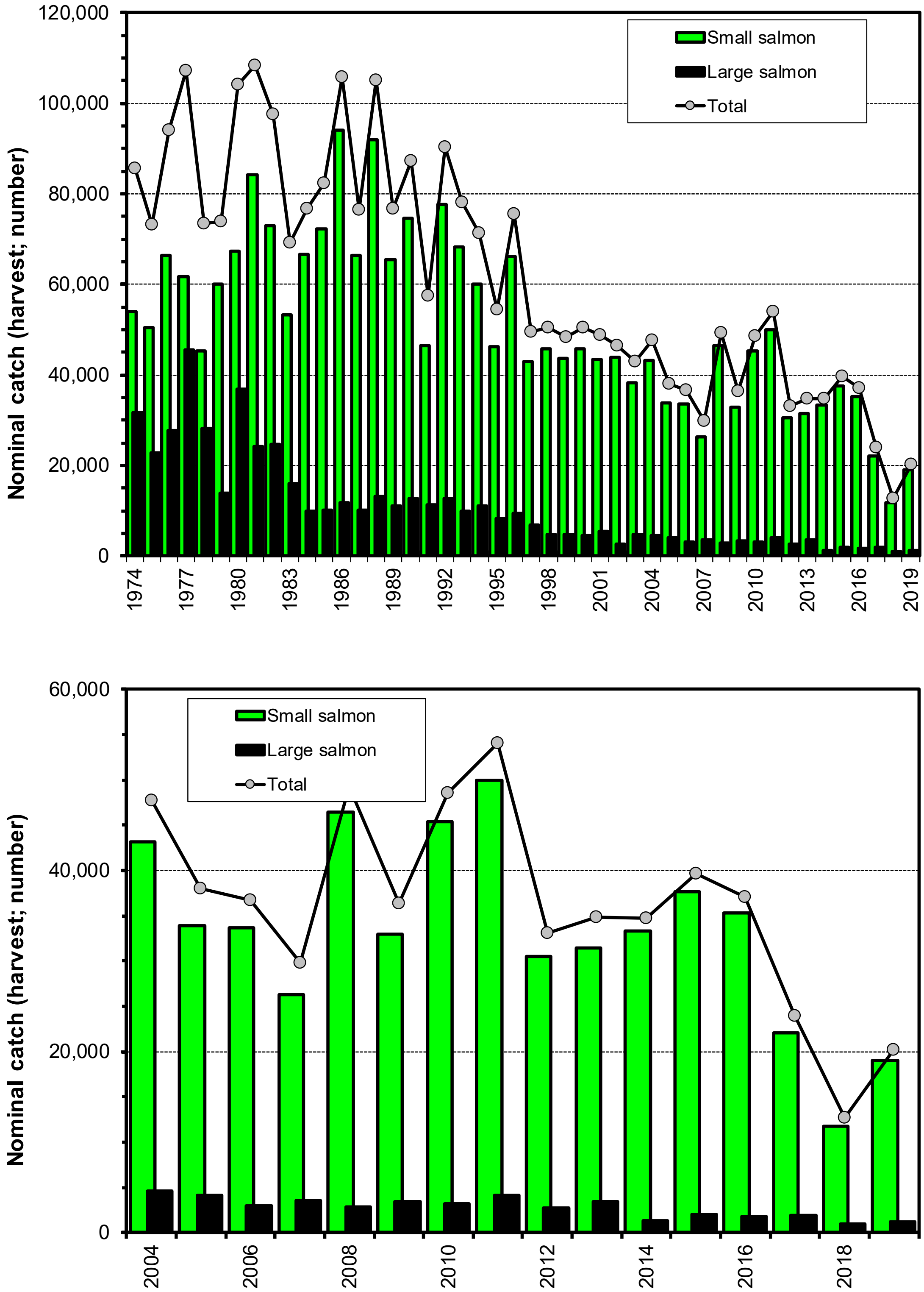


Figure 4.1.3.2. Nominal catch (harvest; number) of small salmon, large salmon, and both sizes combined in the recreational fisheries of Canada, 1974 to 2019 (top panel) and 2004 to 2019 (bottom panel).

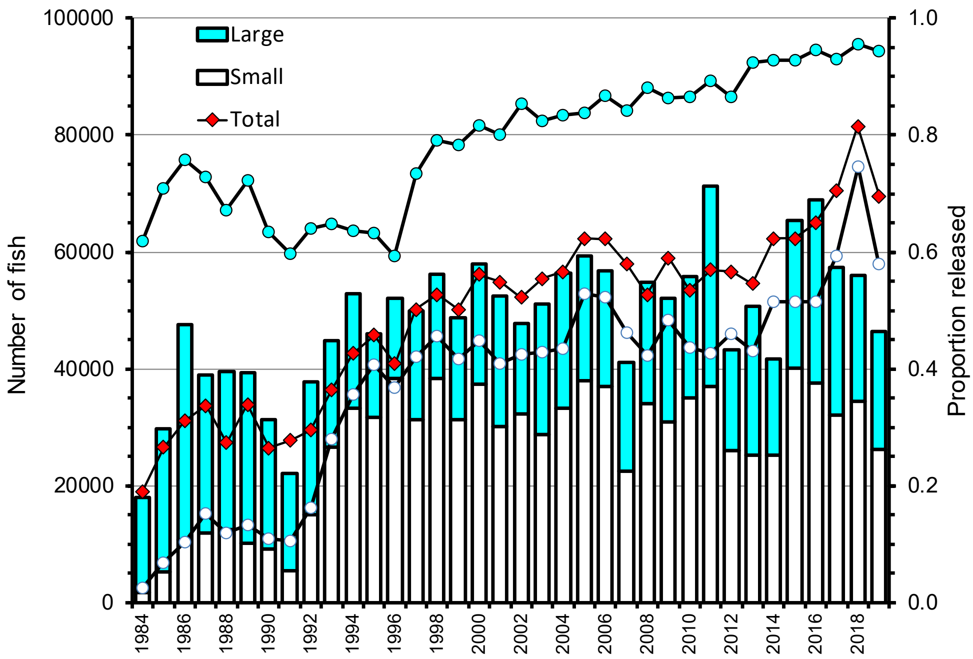


Figure 4.1.3.3. The number (bars) of caught and released small salmon and large salmon in the recreational fisheries of Canada, 1984 to 2019. Black lines represent the proportion released of the total catch (released and retained); small salmon (open circle) large salmon (teal) and both sizes combined (red diamond).

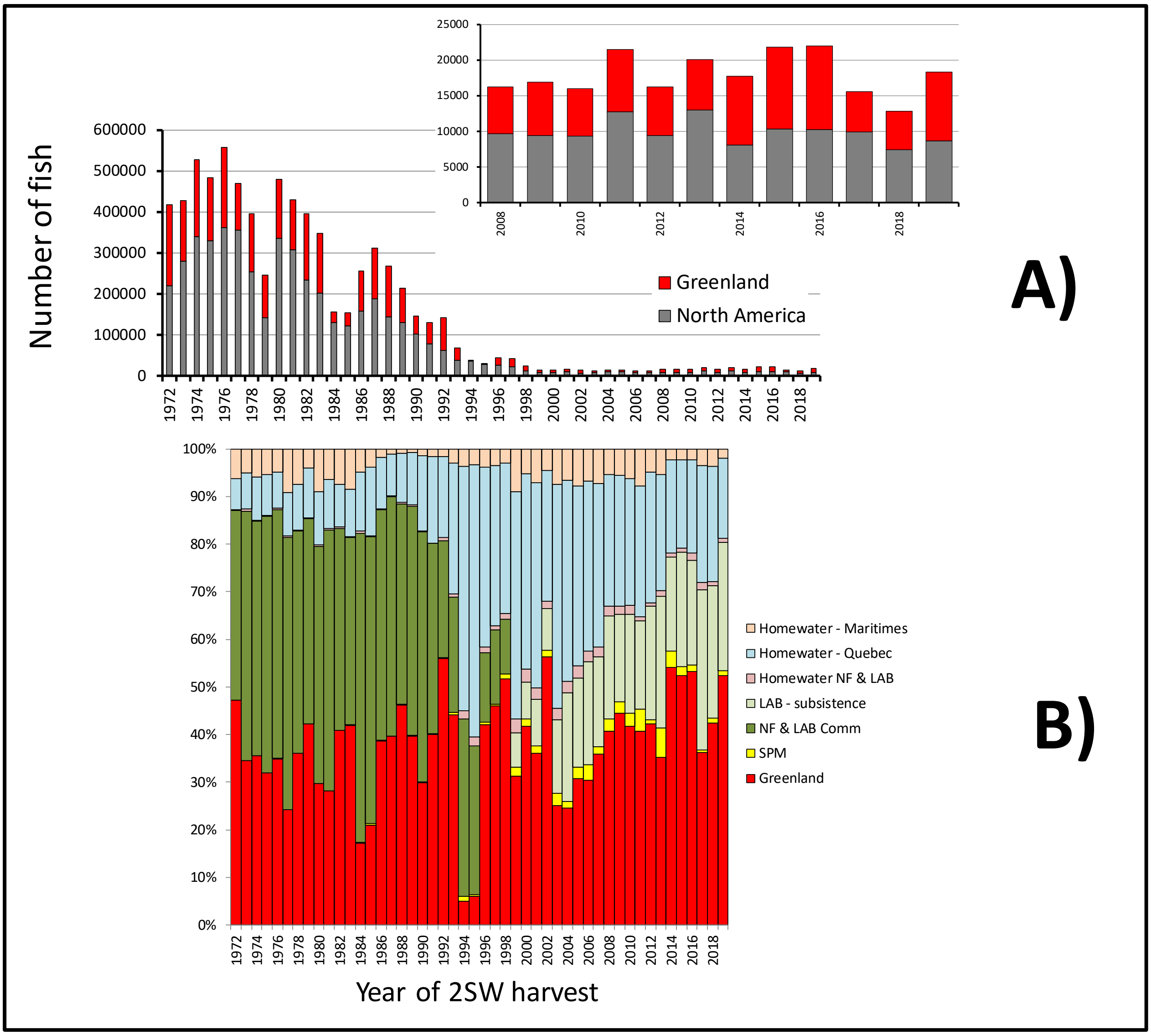


Figure 4.1.4.1. Estimates of 2SW salmon harvest equivalents (number of fish; year of 2SW harvests) taken at Greenland (year – 1) and in North America (upper panel A) and the percentages of the North American origin 2SW salmon harvest equivalents taken in various fishing areas of the North Atlantic (lower panel B) 1972 to 2019.

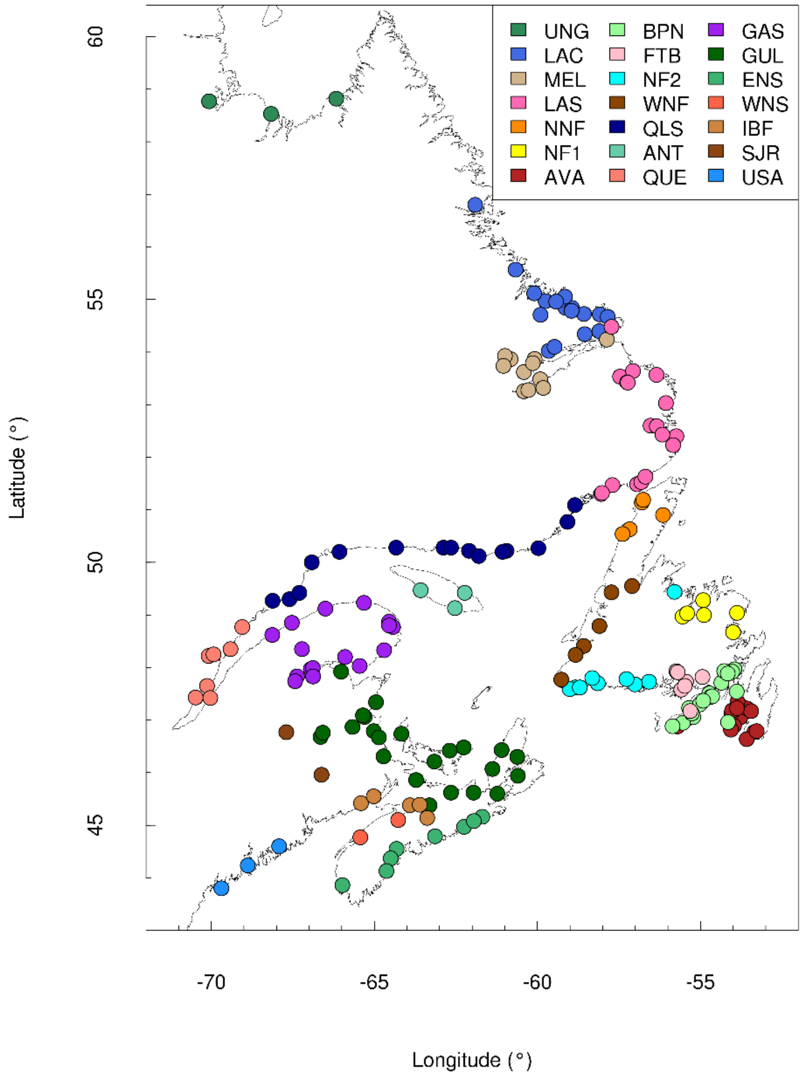


Figure 4.1.5.1 Map of North American sample locations used in the development of the SNP range wide baseline for Atlantic salmon (Jeffrey *et al.*, 2018). The 21 North American reporting groups are labelled and identified by colour). See Figure 4.1.5.2 for full range wide baseline sampling locations.

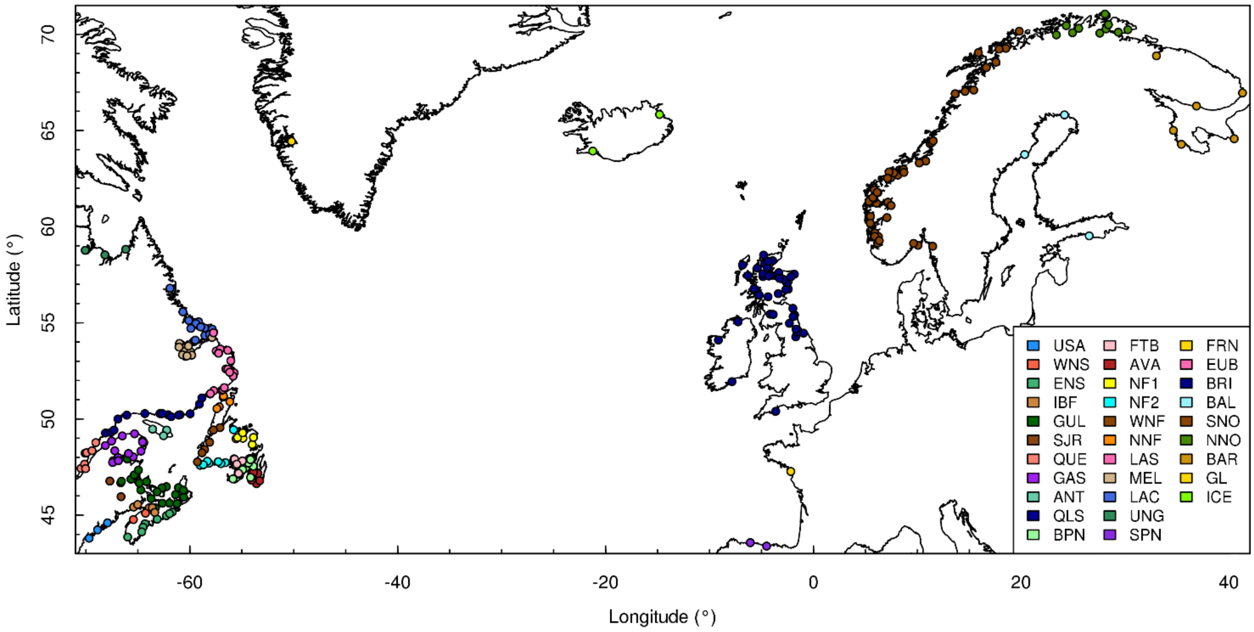


Figure 4.1.5.2. Map of range wide sample locations used in the development SNP baseline for Atlantic salmon and the 31 defined reporting groups (labelled and identified by colour) (Jeffrey *et al.*, 2018). See Figure 4.1.5.1 for finer resolution of North American locations.

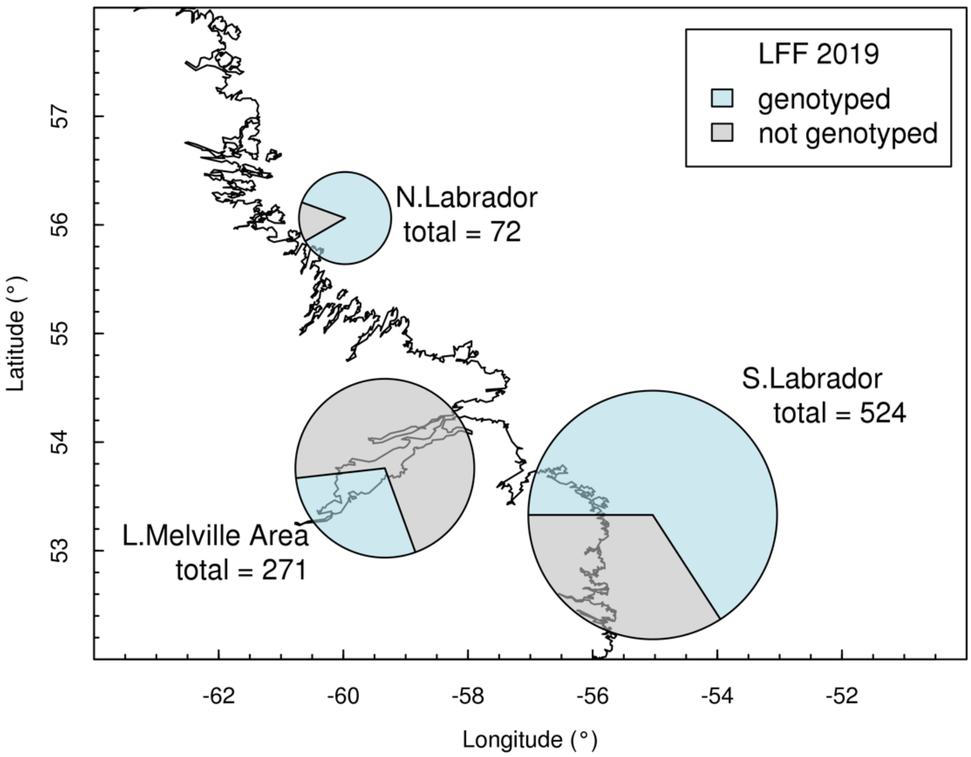


Figure 4.1.5.3. Total tissue samples available and proportions of samples genotyped by Salmon Fishing Area in the Labrador Atlantic salmon subsistence fisheries in 2019.

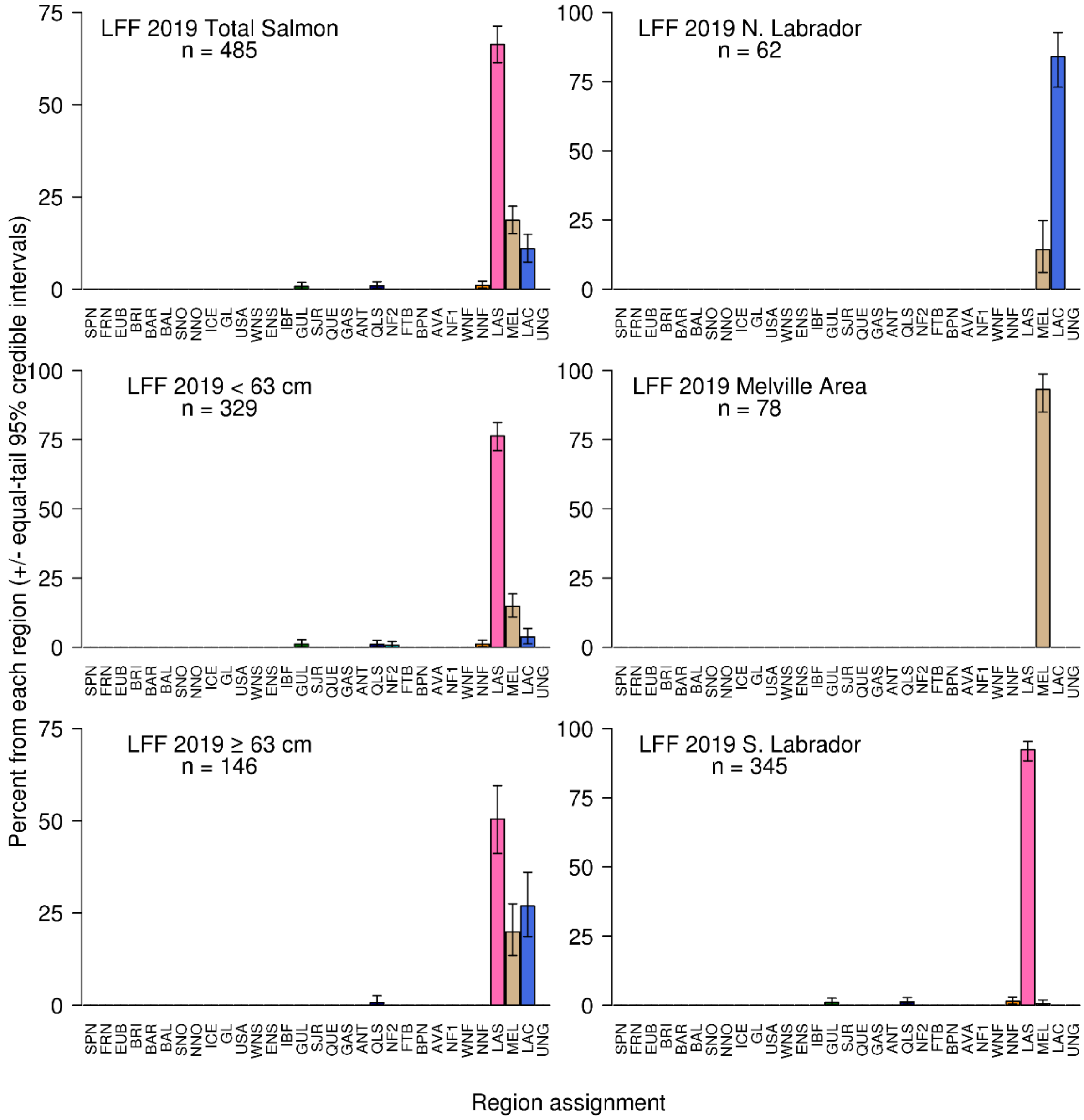


Figure 4.1.5.4. Bayesian estimate of mixture composition of samples from the Labrador Atlantic salmon fisheries for 2019 by size group (small <63 cm, large ≥63 cm) and region (Figure 4.1.2.1: SFA 1A – N. Labrador, SFA 1B – Lake Melville, and SFA 2 –S. Labrador) using the SNP range wide baseline for Atlantic salmon (Jeffrey et al. 2018). Baseline locations refer to regional reporting groups identified in Figure 4.1.5.1 and Figure 4.1.5.2. Regional assignment acronyms are explained in Table 4.1.5.1. Data are summarized in Table 4.1.5.2. Note that credible intervals with a lower bound including zero indicate little support for the mean assignment value.

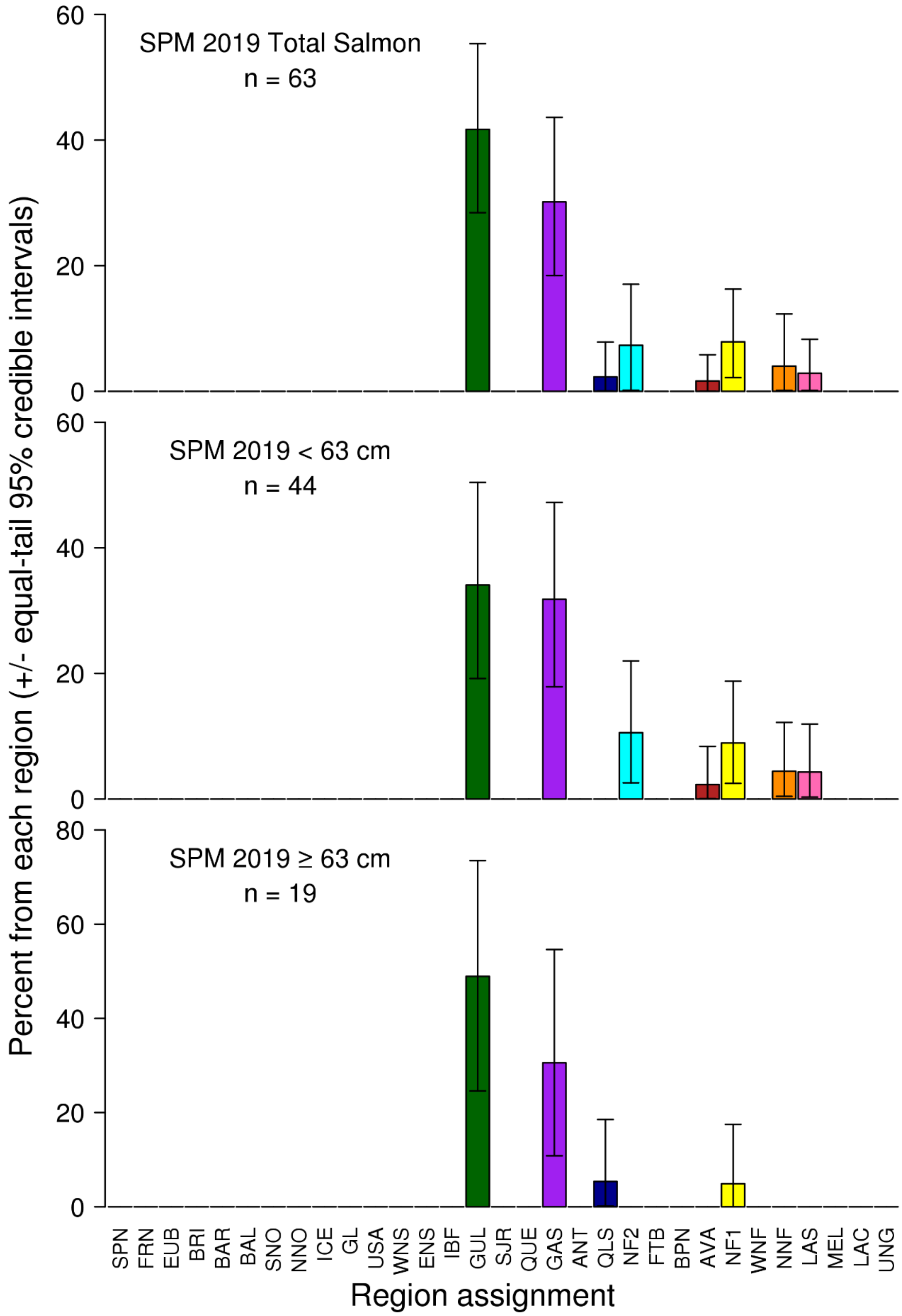


Figure 4.1.5.5. Bayesian mixture estimates of composition of samples collected from the 2019 Saint Pierre and Miquelon Atlantic salmon fishery using the SNP range wide baseline for Atlantic salmon (Jeffrey *et al.*, 2018), overall and by size group (small <63 cm, large ≥63 cm). Baseline locations refer to regional reporting groups identified in Figure 4.1.5.1 and Figure 4.1.5.2. Regional assignment acronyms explained in Table 4.1.5.1. Data summarized in Table 4.1.5.3. Note that credible intervals with a lower bound including zero indicate little support for the mean assignment value.

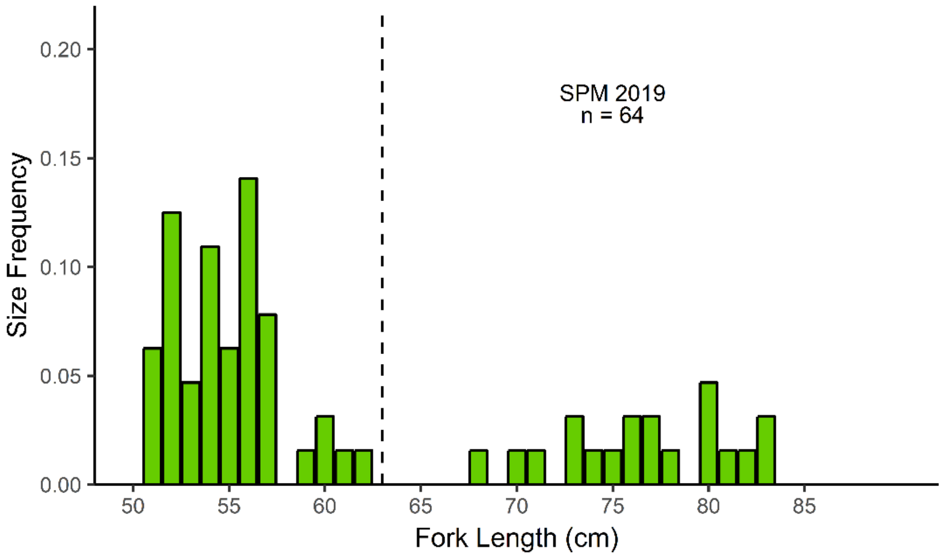


Figure 4.1.5.6. Length–frequency distribution of Atlantic salmon samples from the Saint Pierre and Miquelon Atlantic salmon fishery in 2019. The dotted vertical line is the 63 cm fork length cut-off for small salmon (< 63 cm) and large salmon (≥ 63 cm).

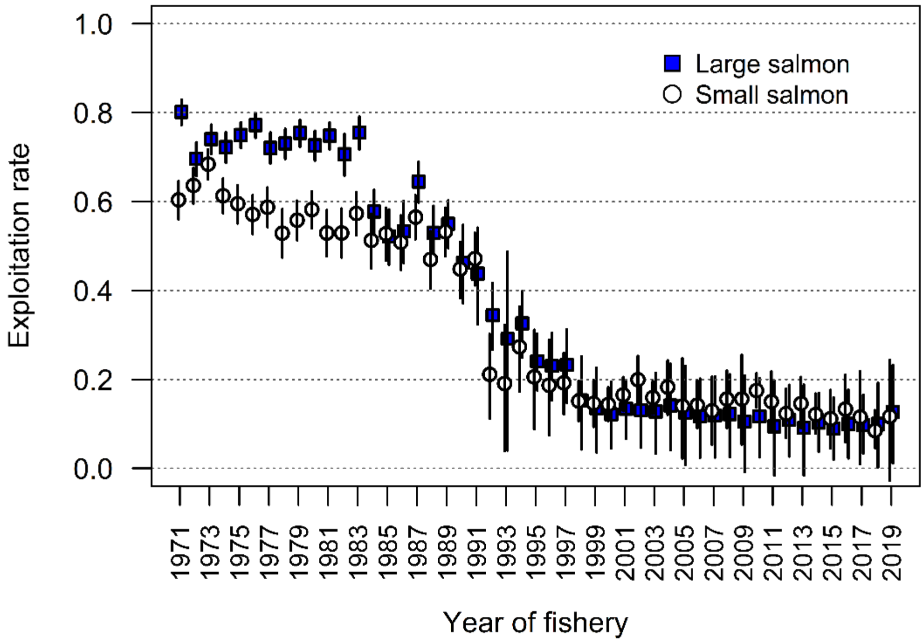


Figure 4.1.6.1. Exploitation rates in North America on the North American stock complex of small and large salmon 1971 to 2019. The symbols are the median and the error bars are the 5th to 95th percentiles of the distributions from Monte Carlo simulation.

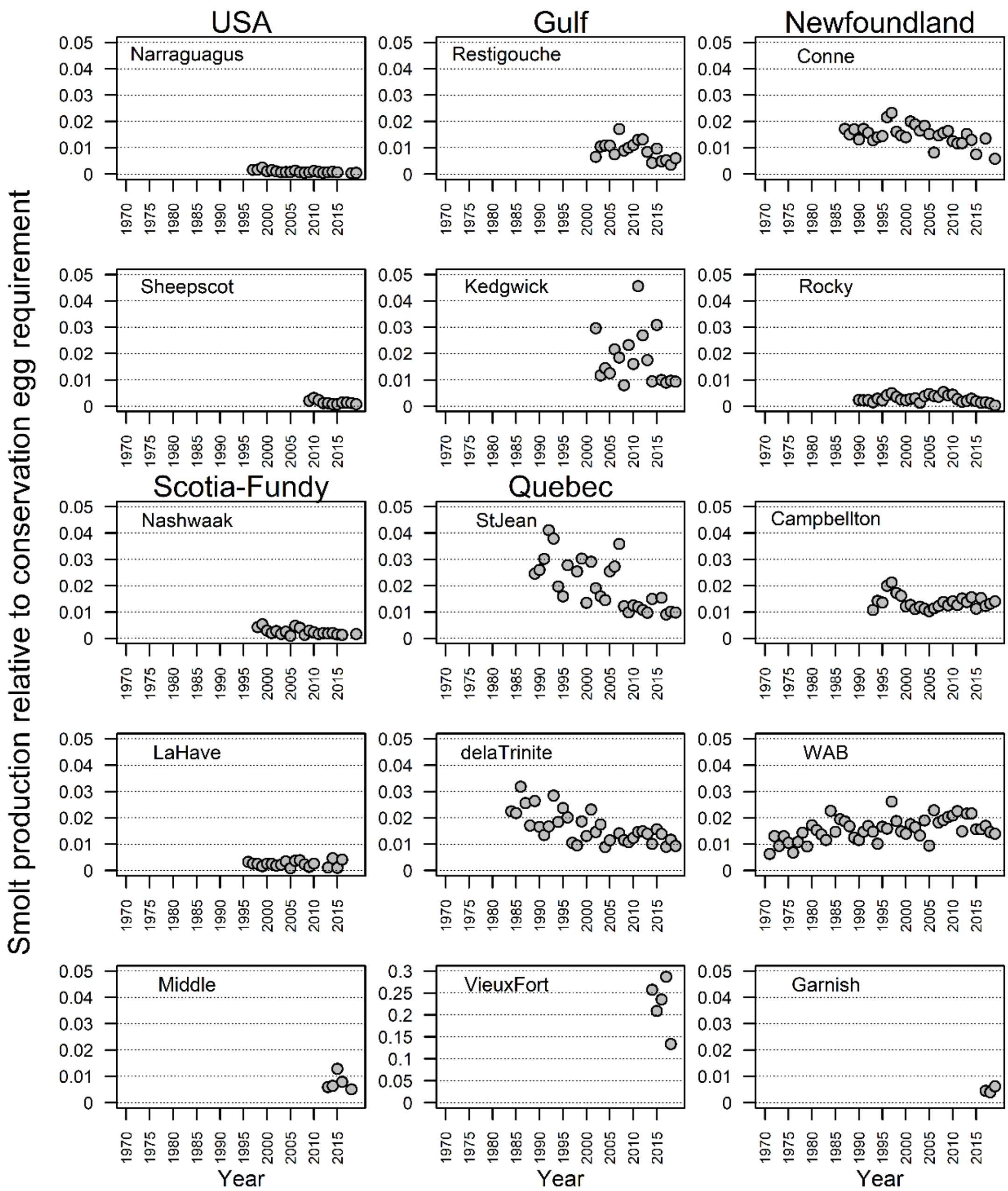


Figure 4.3.1.1. Time-series of wild smolt production from thirteen monitored rivers in eastern Canada and two rivers in eastern USA, 1970 to 2019. Smolt production is expressed as a proportion of the conservation egg requirements for the river. Note y-axis range change for the Vieux-Fort River relative to other rivers.

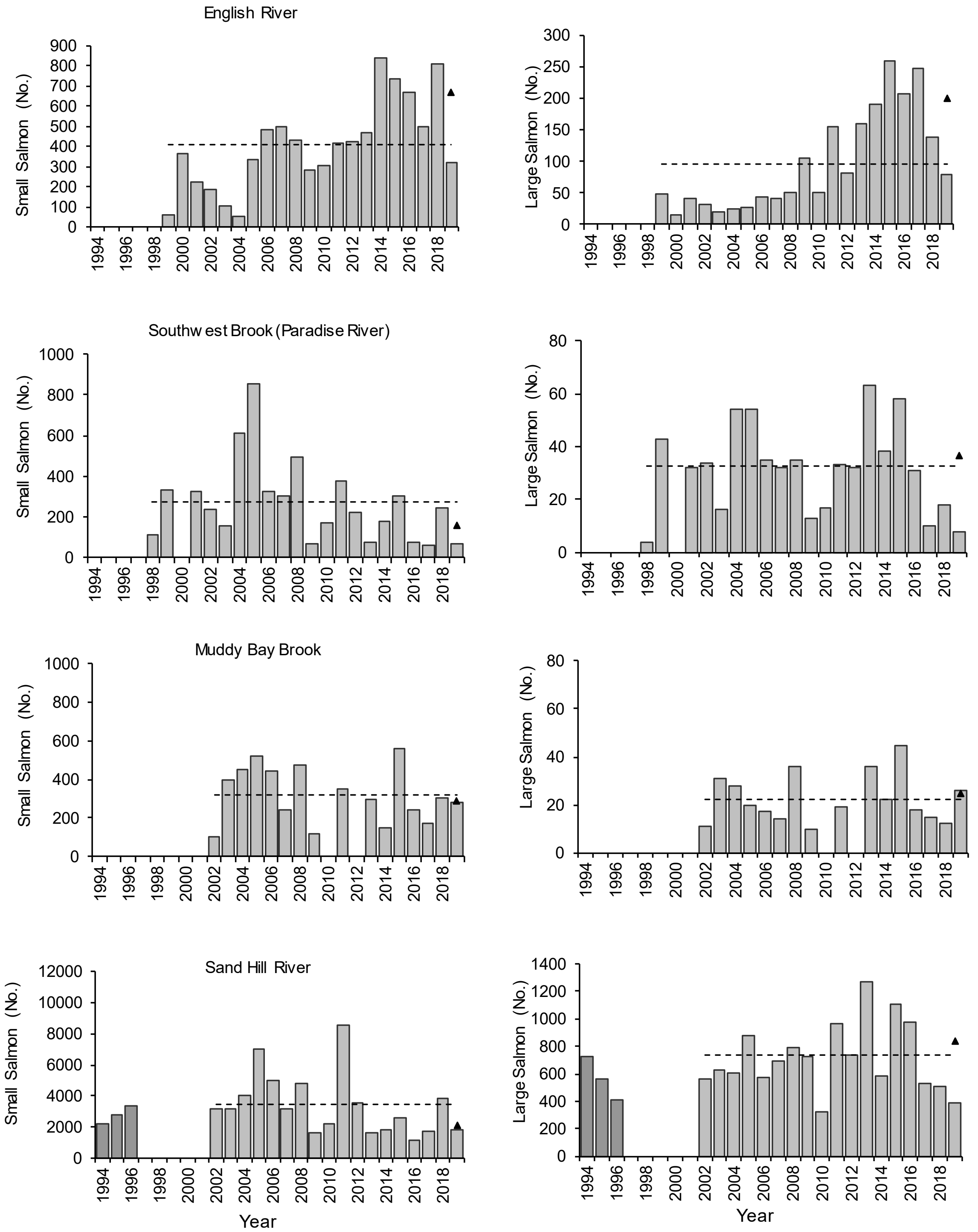


Figure 4.3.2.1. Total returns of small salmon (left column) and large salmon (right column) to English River (SFA 1), Southwest Brook (Paradise River) (SFA 2), Muddy Bay Brook (SFA 2), and Sand Hill River (SFA 2) Labrador, 1994–2019. The solid horizontal line represents the pre-moratorium (commercial salmon fishery in Newfoundland and Labrador) mean, the dashed line the moratorium mean, and the triangles the previous six-year mean.

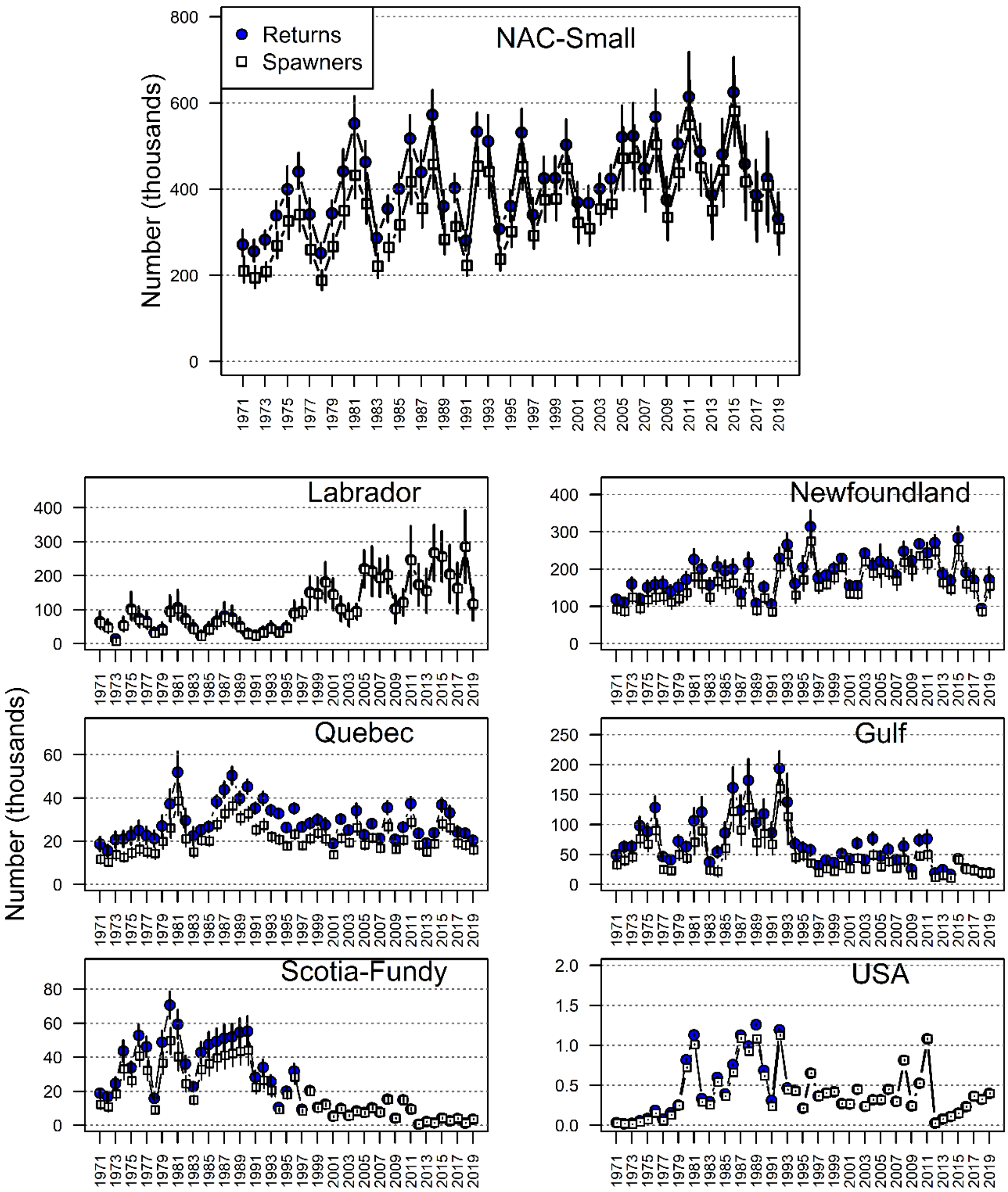


Figure 4.3.2.2. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open square) of small salmon for NAC and to each of the six assessment regions 1971 to 2019. Returns and spawners for Scotia-Fundy do not include those from SFA 22 and a portion of SFA 23.

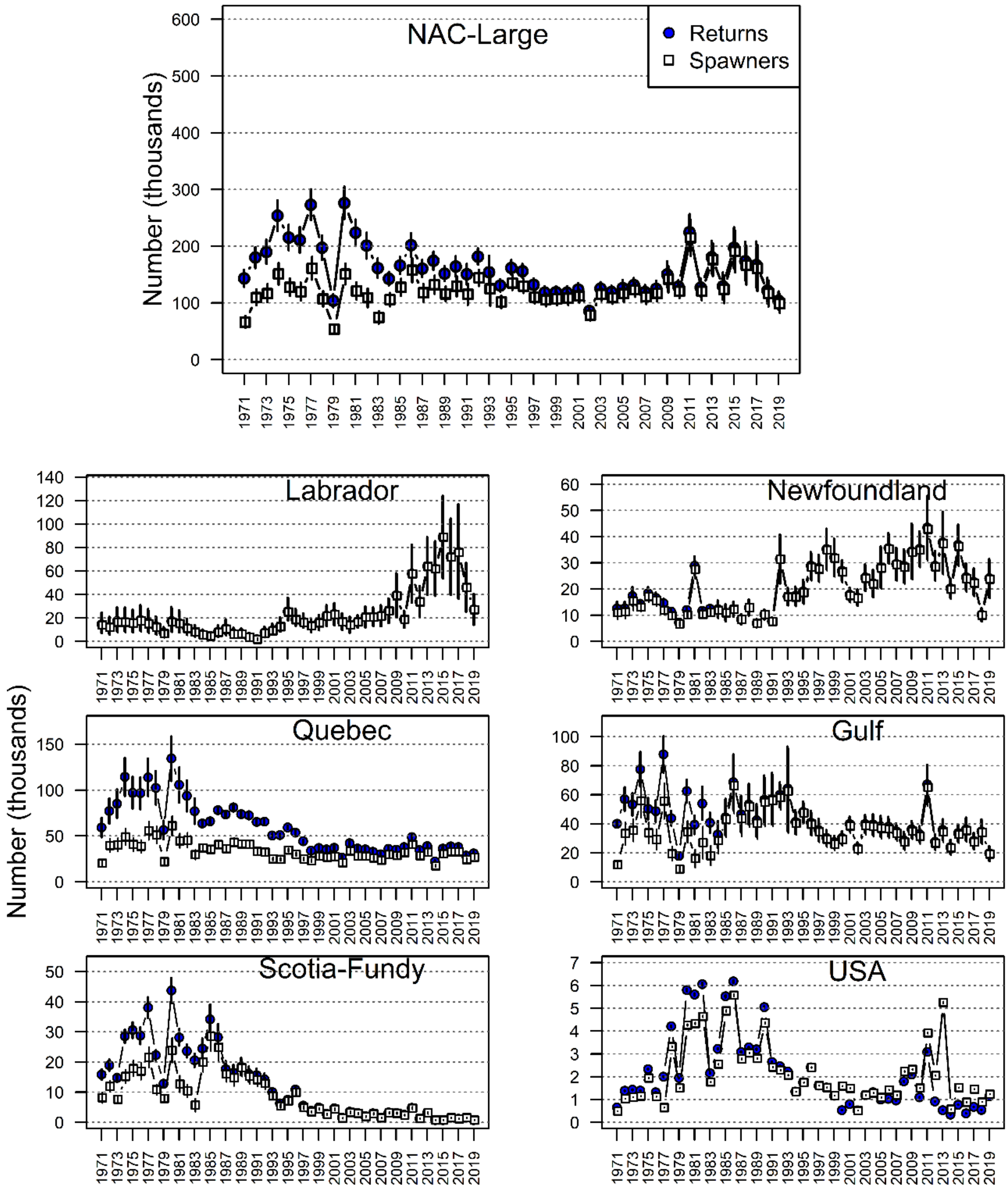


Figure 4.3.2.3. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open square) of large salmon for NAC and to each of the six assessment regions 1971 to 2019. Returns and spawners for Scotia-Fundy do not include those from SFA 22 and a portion of SFA 23. For USA, estimated spawners exceed the estimated returns due to adult stocking restoration efforts.

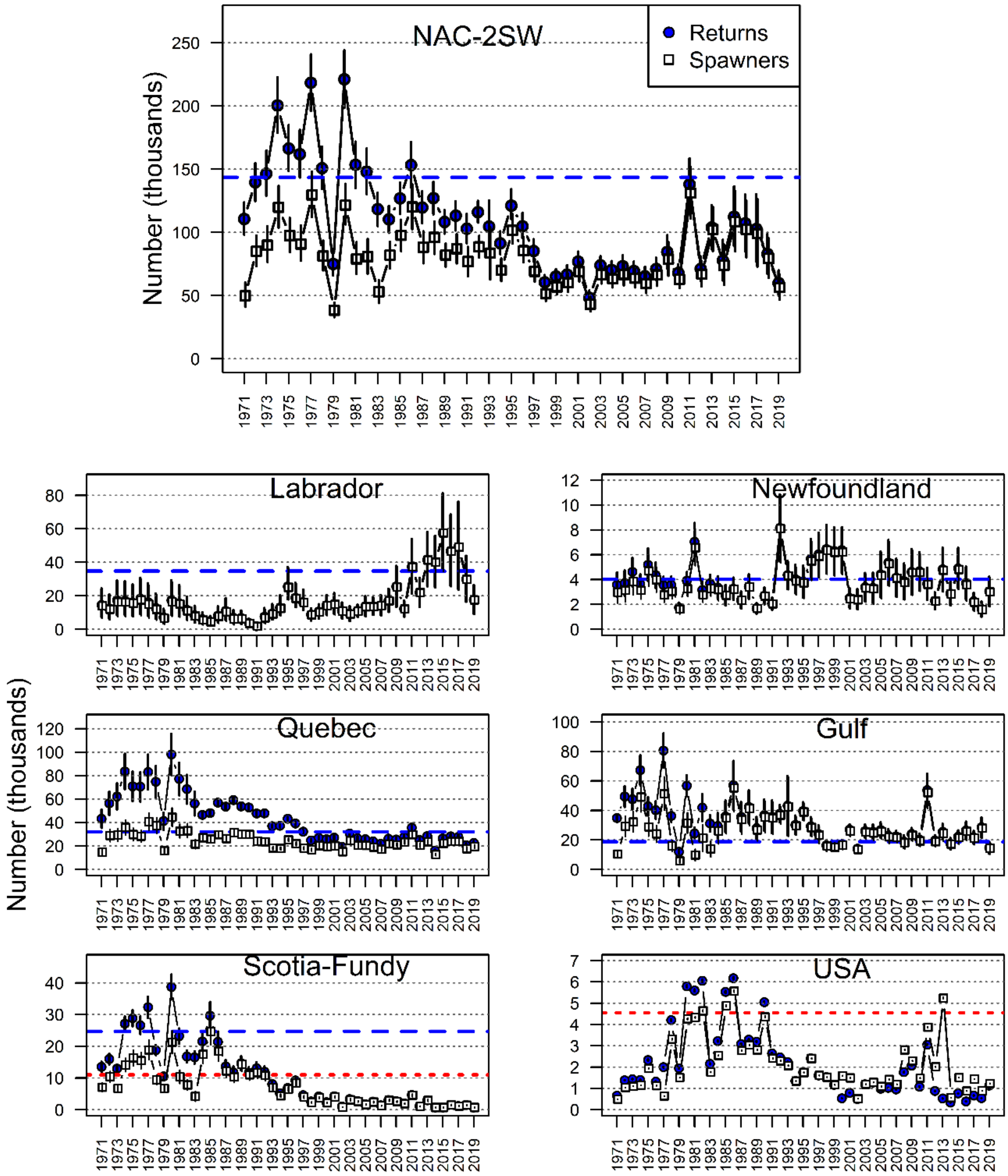


Figure 4.3.2.4. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open square) of 2SW salmon for NAC and to each of the six assessment regions 1971 to 2019 The dashed line is the corresponding 2SW Conservation Limit for NAC overall and for each region; the 2SW CL for USA (29 990 fish) is off the scale in the plot for USA. The dotted line in the Scotia-Fundy and USA panels are the region specific management objectives. Returns and spawners for Scotia-Fundy do not include those from SFA 22 and a portion of SFA 23. For USA, estimated spawners exceed the estimated returns in the later years due to adult stocking restoration efforts; therefore 2SW returns are assessed relative to the management objective for USA.

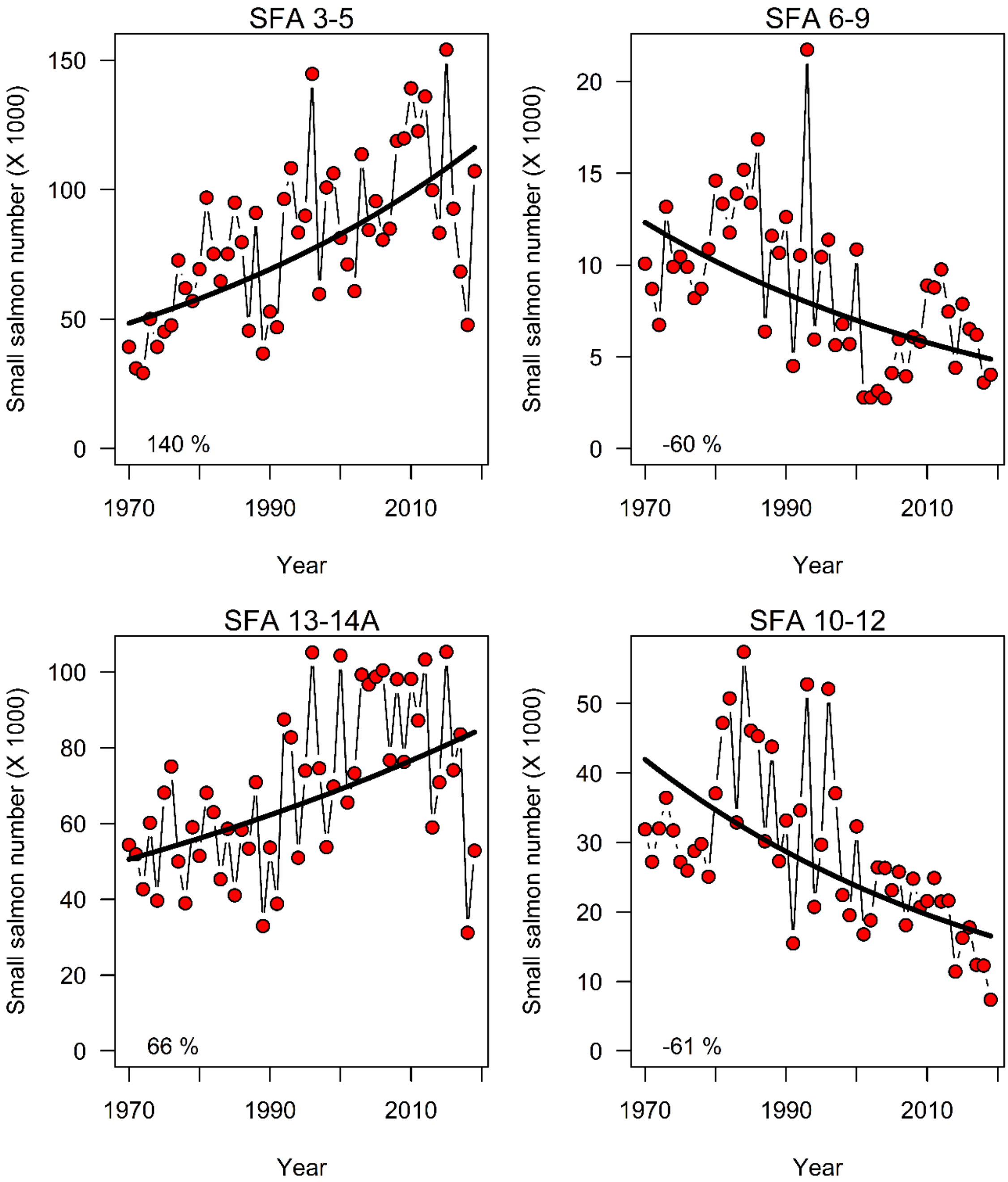


Figure 4.3.2.5. Estimated (median, X 1000) returns of small salmon to subregions of Newfoundland (SFA locations are shown in Figure 4.1.2.1) over the period 1971 to 2019. The exponential trend line and the percent change over the time-series are shown in each panel.

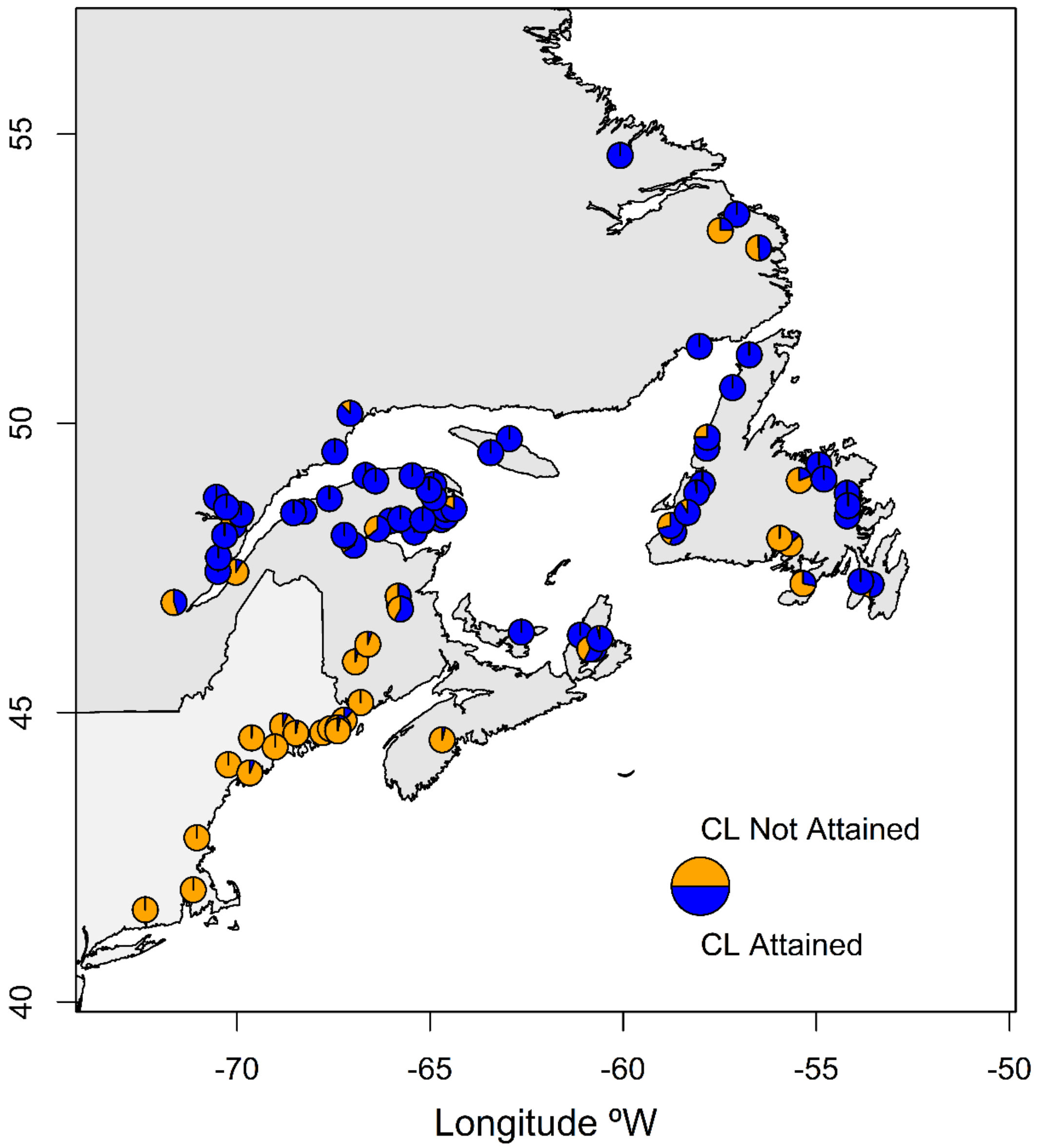


Figure 4.3.4.1. Proportion of the conservation requirement attained in the 86 assessed rivers of the North American Commission area in 2019.

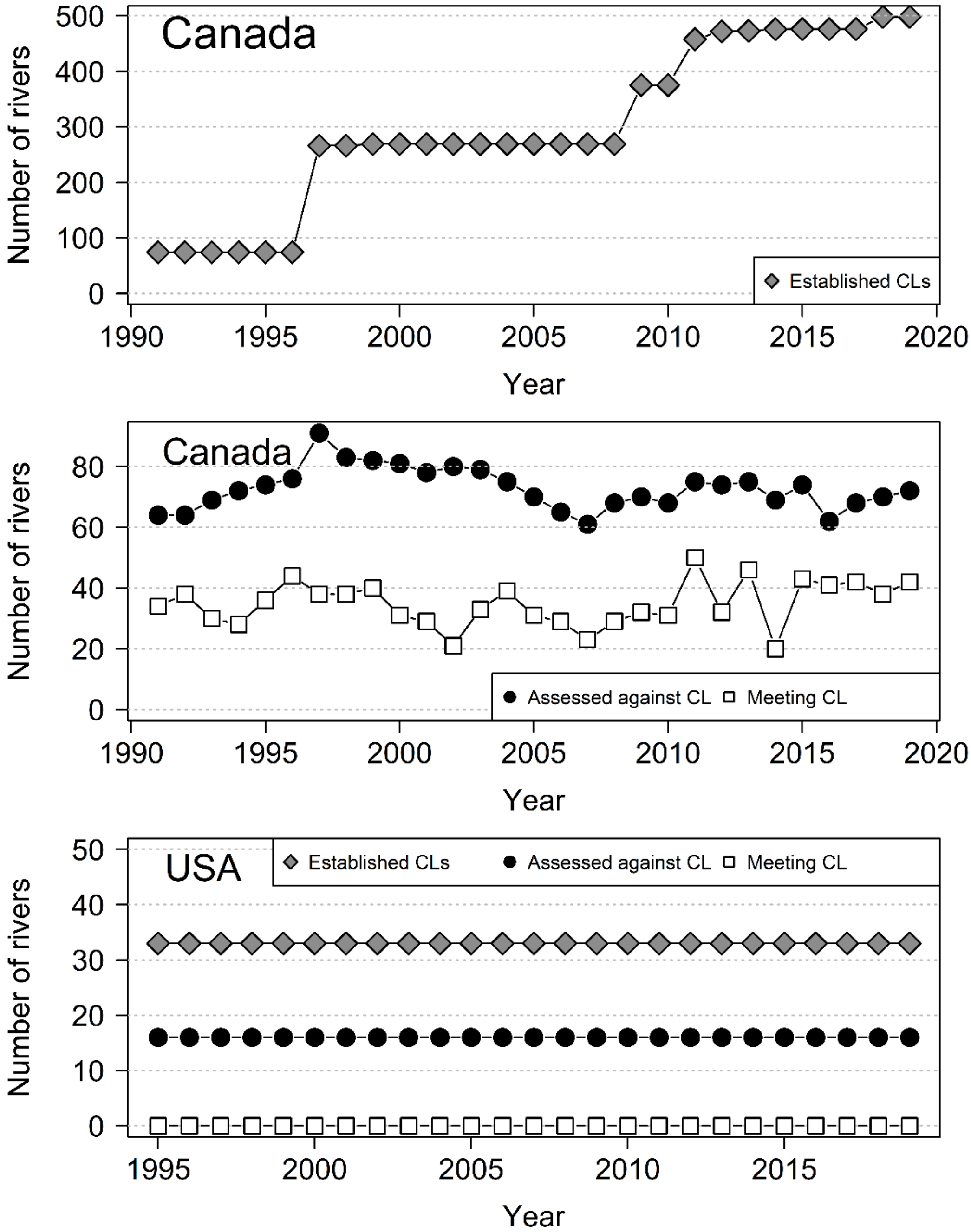


Figure 4.3.4.2. Time-series for Canada and the USA showing the number of rivers with established CLs, the number rivers assessed, and the number of assessed rivers meeting CLs for the period 1991 to 2019.

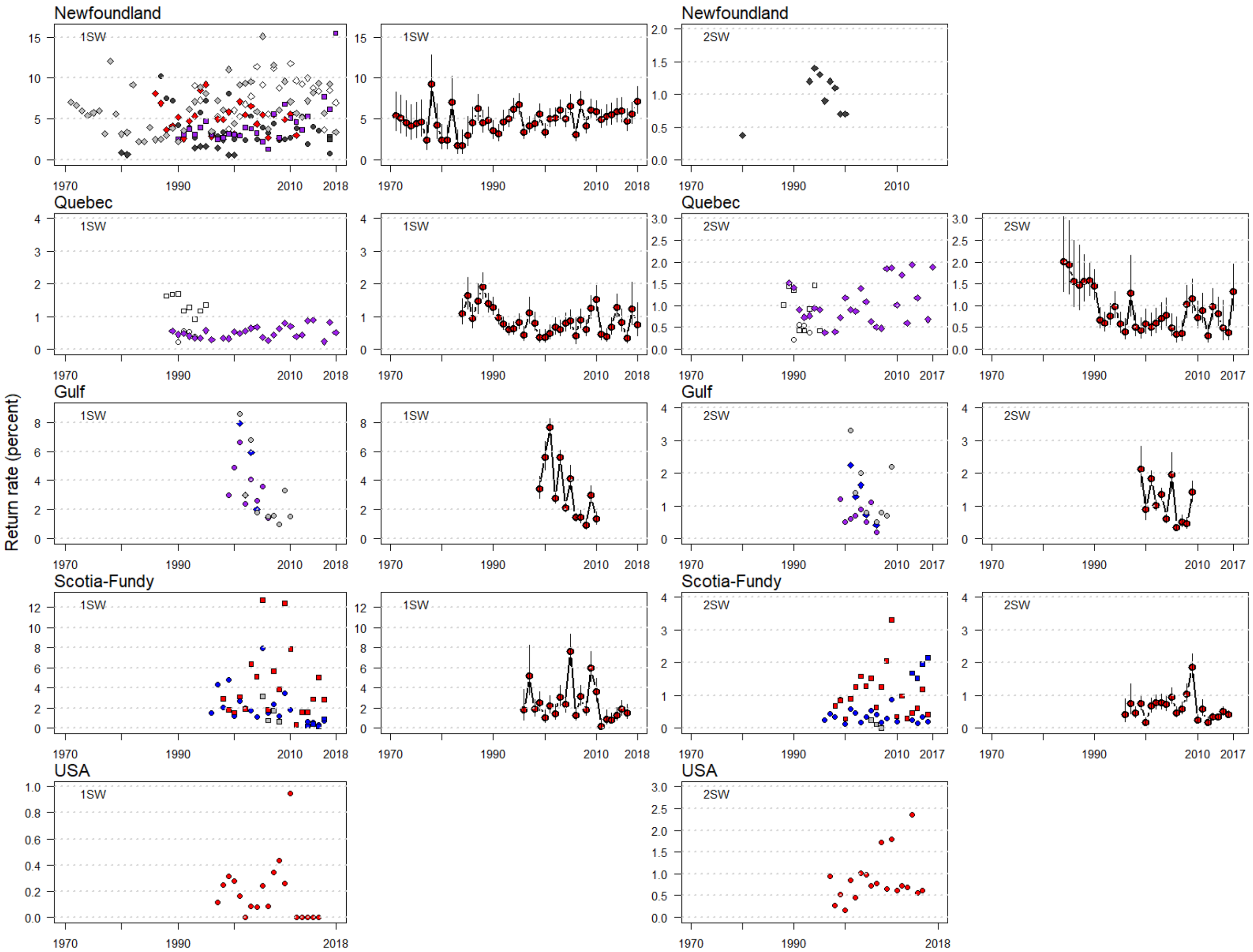


Figure 4.3.5.1. Estimated annual return rates (left and third column of panels; individual rivers are shown with different symbols and colours) and least squared (or marginal mean) mean annual return rates (with one standard error bars) (second and right column of panels) of wild origin smolts to 1SW and 2SW salmon to the geographic areas of North America. The standardized values are annual means derived from a general linear model analysis of rivers in a region. Note y-scale differences among panels. Standardized rates are not shown for regions with a single population.

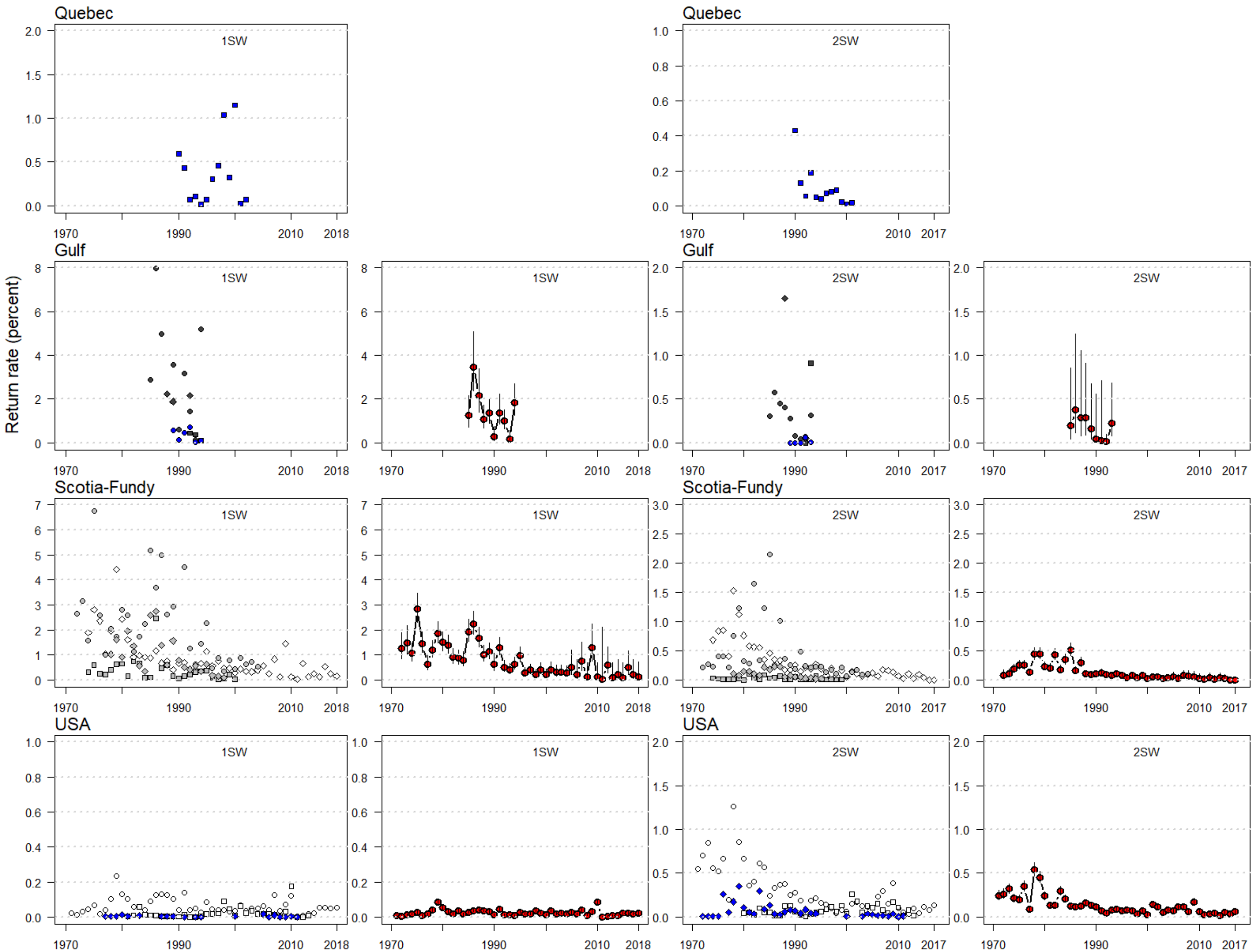


Figure 4.3.5.2. Estimated annual return rates (left and third column of panels; individual rivers are shown with different symbols and colours) and least squared (or marginal mean) mean annual return rates (with one standard error bars) of hatchery origin smolts to 1SW and 2SW salmon to the geographic areas of North America. The standardized values are annual means derived from a general linear model analysis of rivers in a region. Note y-scale differences among panels. Standardized rates are not shown for regions with a single population.

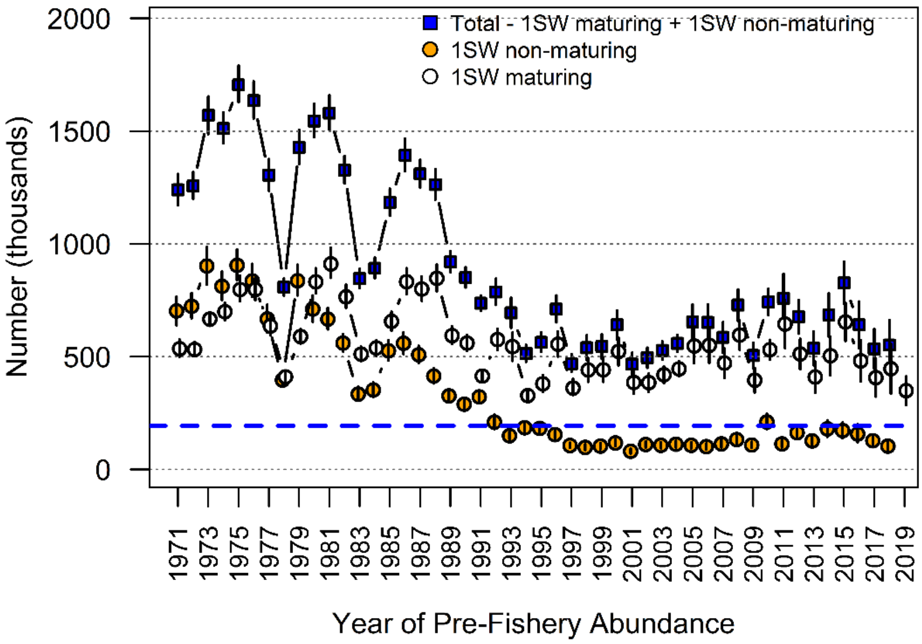


Figure 4.3.6.1. Estimated (median, 5th to 95th percentile range, X 1000) Pre-fishery Abundance (PFA) for 1SW maturing, 1SW non-maturing, and total cohort of 1SW salmon for NAC, PFA years 1971 to 2019. The dashed blue horizontal line is the corresponding sum of the 2SW conservation limits for NAC (143 494) corrected for 11 months of natural mortality (193 697) against which 1SW non-maturing are assessed.

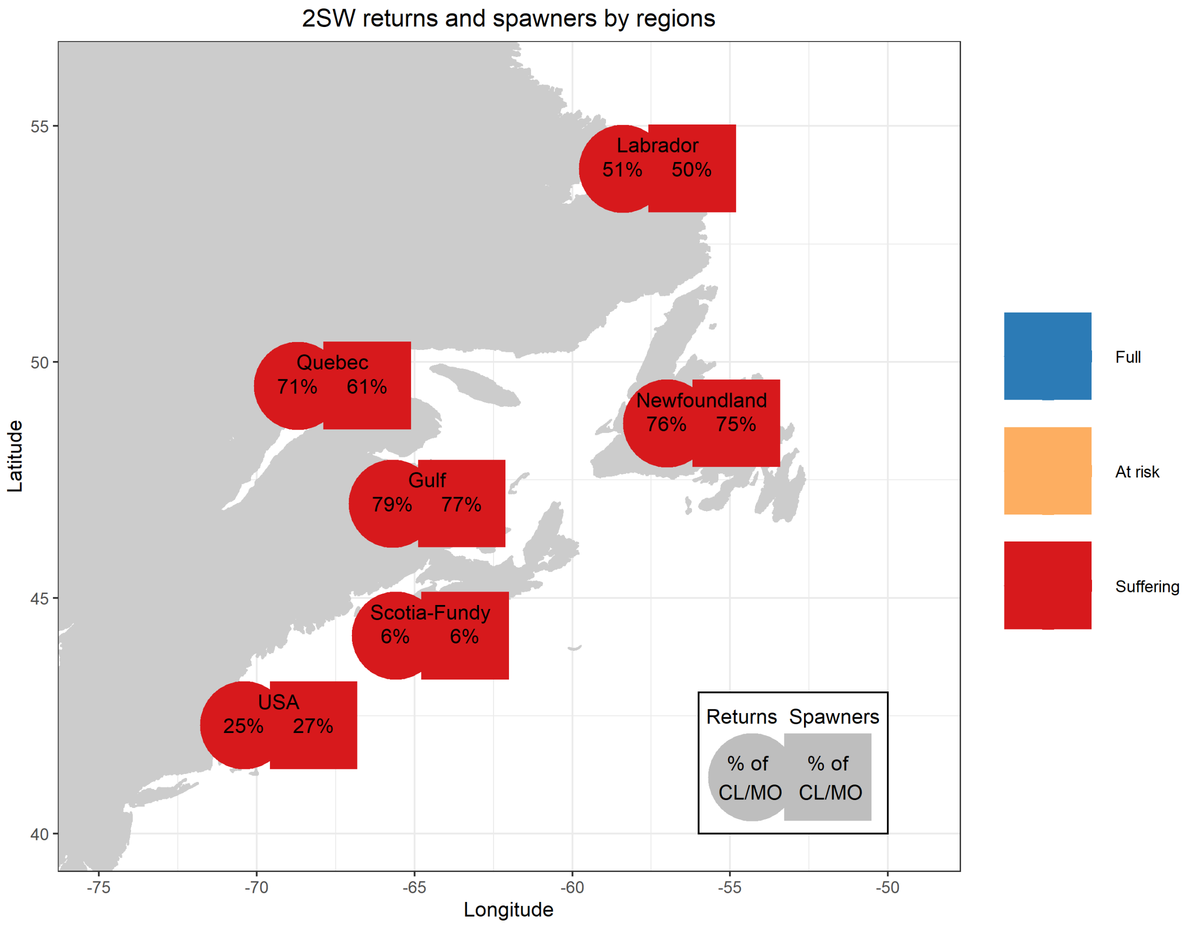


Figure 4.3.7.1. Estimated returns (circle symbol) and spawners (square symbol) of 2SW salmon in 2019 to six assessment regions of North America relative to ICES stock status categories. The percentage of the 2SW CLs for the four northern regions and to the rebuilding management objectives (MO) for the two southern areas are shown based on the median of the Monte Carlo distribution. The colour shading is interpreted as follows: blue refers to the stock being at full reproductive capacity (median and 5th percentile of the Monte Carlo distributions are above the CL), orange refers to the stock being at risk of suffering reduced reproductive capacity (median is above but the 5th percentile is below the CL), and red refers to the stock suffering reduced reproductive capacity (the median is below the CL).

5 Atlantic salmon in the West Greenland Commission

5.1 NASCO has requested ICES to describe the key events of the 2019 fishery

The previous advice provided by ICES (2018) indicated that there were no mixed-stock fishery catch options on the 1SW non-maturing salmon component for the 2018 to 2020 PFA years. The NASCO Framework of Indicators for the West Greenland Commission, applied in January 2020, did not indicate the need for a revised analysis of catch options and therefore no new management advice for 2020 is provided. This year's assessment of the contributing stock complexes confirms the previously provided advice.

The Atlantic salmon fishery is regulated according to the Government of Greenland's Executive Order no. 5 of 21 September 2018. Since 1998, with the exception of 2001, the export of Atlantic salmon has been banned. From 2002–2017 there have been two landing categories reported for the fishery: commercial landings where professional licensed fishers can sell salmon to hotels, institutions and local markets and private landings where both licensed and unlicensed fishers fish for private consumption. During 2012 to 2014 (for the first time since 2001), licensed fishers were additionally allowed to land to factories and a 35 t factory quota was set by the Greenland authorities. This quota was reduced to 30 t in 2014. The quota did not apply to the commercial or private landings, and the export ban persisted as the landed salmon could only be sold within Greenland. In 2015, the Government of Greenland unilaterally set a quota for all components of the fishery (private, commercial, and factory landings) to 45 t as a quota could not be agreed by all parties of the West Greenland Commission of NASCO (NASCO, 2015; see WGC(15)21). The Government of Greenland did agree that any overharvest in a particular year would result in an equal reduction in the catch limit in the following year and, as a result of an overharvest in 2015, the 2016 quota was unilaterally set by Greenland to 32 t. Given the lack of overharvest in 2016, the 2017 quota was set to 45 t. The export ban persisted as the landed salmon could only be sold within Greenland.

In 2018, the Government of Greenland set a total quota for all components of the 2018–2020 fisheries to 30 t annually as agreed by all parties of the West Greenland Commission of NASCO (NASCO, 2018; see WGC(18)11). A 10 t quota was allocated for the private fishery with the balance (20 t) for the commercial fishery. Within the regulatory measure, the Government of Greenland agreed to continue its ban on the export of wild Atlantic salmon or its products from Greenland and to prohibit landings and sales to fish processing factories. They also agreed to restrict the fishery from 15 August to no later than 31 October each year, and any overharvest in a particular year would result in an equal reduction in the total allowable catch in the following year. The regulatory measure also set out a number of provisions aimed at improving the monitoring, management control and surveillance of the fishery including a new requirement for all fishers (private and commercial) to obtain a licence to fish for Atlantic salmon, an agreement to collect catch and fishing activity data from all licensed fishers, and mandatory reporting requirements of all fishers. The measure also stated that as a condition of the licence, all fishers will be required to allow samplers from the NASCO sampling program to take samples of their catches upon request. The measure was applied to the 2018 and 2019 fisheries and will apply to the 2020 fishery as the FWI indicated no significant change in the previously provided catch advice. Given the 2018 fishery overharvest, the 2019 fishery quota was set to 19.5 t.

Only hooks, fixed gillnets and driftnets are allowed to target salmon directly and the minimum mesh size has been 140 mm (stretched mesh) since 1985. Since 2015, the fishing season has been set from 15 August with a closing date of 31 October or until the total quota was reached.

The 2019 fishery opened on 15 August and was closed on 25 September when a total of 19.5 t had been registered. However, in spite of the in-season reporting, delays in the reporting and registration of catches resulted in the total reported landings increasing to 29.8 t. This resulted in an overharvest of 10.3 t.

5.1.1 Catch and effort in 2019

Commercial fishers are allowed to use up to 20 gillnets at a time either as single gillnets fixed to the shore, or up to 20 sections (~70 m per section) connected and used as a driftnet. Private licensed fishers can only use one gillnet fixed to the shore. All nets must be tended regularly and marked with name and contact information. Gillnets are only allowed in the inshore areas.

Nets are the preferred gear in Greenland, and very little rod and reel fishing in salt water takes place. However, a recreational fishery directly targeting salmon via rod and reel, seems to be slowly evolving among a small number of residents in the Nuuk and Qaqortoq regions. Reports from recreational fishers fishing with rod and reel are received annually and are included in the reported landings, but landings from this gear type are considered insignificant at this time.

Catch data were collated from fisher reports. The reports were screened for errors and missing values. Catches were assigned to a NAFO/ICES Division based on the reporting community. Reports which contained only the total number of salmon caught or the total catch weight without the number of salmon, were corrected using 3.25 kg gutted weight per salmon. Since 2005, it has been mandatory to report gutted weights, and these have been converted to whole weight using a conversion multiplier of 1.11.

In 2019, a total catch of 29.8 t was reported, and was distributed among the six NAFO Divisions on the west coast of Greenland and in ICES Division 14 on the east coast of Greenland (Tables 5.1.1.1 and 5.1.1.2; Figure 5.1.1.1). The 2019 reported landings is a decrease from the 2018 value with the majority being reported from West Greenland as in previous years. Harvest reported for East Greenland is not included in assessments of the contributing stock complexes, owing to a lack of information on the stock composition of that fishery. Reported landings of Atlantic salmon increased from 60 t in 1960 to a peak of 2689 t reported in 1971 and generally decreased until the closure of the export commercial fishery in 1998. Reported landings for the internal use only fishery peaked at 57.8 t in 2014 and have averaged 38.8 t over the past ten years (2010–2019; Table 5.1.1.1; Figure 5.1.1.2). The majority of the catch in 2019 was reported by commercial fishers for commercial purposes as in previous years (Tables 5.1.1.3 and 5.1.1.4; Figure 5.1.1.2). A small amount of private fisher landings (80 kg) were identified as for commercial use, although private fishers are not allowed to sell their catch.

Reported Landings							
	Reported Landings (t (%))			Landings Types (t (%))			
	West Greenland only	East Greenland only	Total	Commercial (commercial use)	Commercial (private use)	Private (commercial use)	Private (private use)
2019	28.3 (95.2%)	1.4 (4.8%)	29.8	21.8 (73.2%)	0.1 (0.3%)	0.2 (0.8%)	7.6 (25.7%)
2018	39.0 (98.0%)	0.8 (2.0%)	39.9	32.5 (81.4%)	0.1 (0.4%)	0.0 (0.1%)	7.2 (18.2%)
2017	27.8 (99.0%)	0.3 (1.0%)	28.0	15.3 (54.6%)	9.7 (34.6%)	0.0 (0%)	3.1 (11.1%)

Detailed statistics on the registration of commercial landings for commercial and private use are available from 1997 to the present. The mean percentage of commercial landings registered for private use from 1997–2017 was 44% (range of 19% in 1999 to 67% in 1997 excluding 2001 as all commercial landings were registered as commercial use or as factory landings). In 2019 and 2018, the percentage of commercial landings registered for private use dropped to 0.3% and 0.4% respectively (Tables 5.1.1.3 and 5.1.1.4). The Working Group was informed that the drop may be caused by dynamics associated with the reporting structure of commercial landings rather than underreporting of landings for private use by commercial fishers.

There is currently no quantitative approach for estimating the unreported catch for the fishery, but the 2019 value is likely to have been at the same level as reported by the Greenlandic authorities in recent years (10 t). The 10 t estimate was historically meant to account for private fishers in smaller communities fishing for private use, but not reporting landings. This estimate was not meant to represent non-reporting by commercial fishers.

The Working Group has employed two different approaches to estimate unreported catch from commercial fishers: comparisons of the sampling programme statistics and reported landings and utilizing results from the previously implemented phone surveys. An adjustment for some unreported catch, primarily for commercial landings, has been done since 2002 by comparing the weight of salmon seen by the sampling teams and the corresponding community-specific reported landings for the entire fishing season (see Section 5.2). However, sampling only occurs during a portion of the fishing season and therefore these adjustments are considered minimum adjustments for unreported catch.

The seasonal distribution of catches has previously been reported to the Working Group (ICES, 2002), but since 2002 this has generally not been possible. Although fishers are required to record daily catches, previous comparisons of returned catch reports suggest that many fishers do not provide daily statistics. The seasonal distribution for factory landings, when allowed, is assumed to be accurate given the reporting structure in place between the factories and the Greenland Fisheries Licence Control Authority (GFLK).

The Working Group is aware of the updated reporting requirements starting with the 2015 fishery and they reported on the seasonal distributions of catches for the 2016 and 2017 fisheries (ICES, 2017a; ICES, 2018). The Working Group did not receive a detailed breakdown of the seasonal distributions of catches for the 2018 or 2019 fisheries. Reported landings for the 2016 and 2017 fisheries did seem to reflect general spatial/temporal patterns of the fishery (early reported landings in the southern regions (1D–1F), later reported landings in the northern regions (1A–1C), low landings in the northernmost regions (1A–1B)).

Greenland Authorities issued 717 licences (302 for commercial fishers and 415 for private fishers) and received 1531 reports from 637 fishers in 2019 (Table 5.1.1.3; Table 5.1.1.5; Figure 5.1.1.3). There was a decrease of 27 commercial fishers and an increase of 39 private fishers receiving licences compared to 2018 (Table 5.1.1.4). The number of licences issued, the number of fishers who reported, and the number of reports received have increased greatly since 2017, as a result of the new regulations requiring all fishers to receive a licence and mandatory reporting requirements. These levels are among the highest in the time-series and the number of fishers reporting landings matches the levels recorded during the commercial export fishery from 1987 to 1991.

Licences and Reporting						
	Licences Issued			Number of Fishers Reporting (%)		
	Commercial	Private	Total	Commercial	Private	Total
2019	302	415	717	276 (91.4%)	361 (87.0%	637 (89.0%)
2018	329	457	786	235 (71.4%)	322 (70.5%)	557 (70.9%)
2017	282	-	282	93 (33.0%)	50 (-)	143 (-)

The Working Group previously reported on the procedures for reporting salmon harvested in Greenland (ICES, 2014; ICES, 2016) and modifications to these procedures were made by the Government of Greenland in 2018. In summary, all fishers are required to have a licence to fish for Atlantic salmon and all licence holders are required to report catches. Reports can be made to GFLK by email, phone, fax, or return logbook on a daily basis. Factory landings, when allowed, are submitted to GFLK either on a daily or weekly basis, depending on the likelihood of exceeding a quota. No factory landings have been allowed since 2015.

Similar information is requested for factory, commercial and private fisher landings. Requested data include fishing date, location, and information on catch and effort required for the calculation of catch per unit of effort statistics. These types of data allow for a more accurate characterization and assessment of the nature and extent of the fishery than is currently available. The Working Group did not receive any detailed statistics beyond reported landings and licence related information by community and NAFO Divisions and therefore could not further characterize and assess the fishery beyond what is currently presented. The Working Group has previously been informed that this level of detail is often lacking from commercial and private landing reports. The variations in the numbers of people reporting catches, variation in reported landings in each of the NAFO Divisions and documentation of previous non-reporting of landings (ICES, 2019) highlights the need for better landings data. The Working Group recommends that the Government of Greenland continue efforts to improve the reporting system of catch in the Greenland fishery and that detailed statistics related to spatially and temporally explicit catch and effort data for all fishers be made available to the Working Group for analysis.

5.1.2 Phone surveys

Phone surveys were conducted in 2015, 2016, and 2017 to assess the 2014, 2015, and 2016 fisheries, respectively. The number of fishers contacted, the questions asked, and the method to estimate unreported catch differed from year to year. Based on the results from these surveys, estimated 'adjusted landings (survey)' of 12.2 t for the 2014 fishery, 5.0 t for the 2015 fishery, and 4.2 t for the 2016 fishery were added to the 'adjusted landings (sampling)' as described in **Section 5.2**, and 'reported landings' to estimate the 'landings for assessment'. A phone survey was initiated for the 2017 fishery, but only nine fishers were contacted. Given the small number of fishers contacted, no landings adjustment were estimated. Phone surveys have not been conducted since the 2017 fishery, and therefore no landing adjustments have been estimated since that time. A summary of the reported landings, adjusted landings (sampling), and adjusted landings (survey) is presented in Table 5.1.2.1. Adjusted 'landings for assessment' do not replace the official reported statistics.

5.1.3 Exploitation

An extant exploitation rate for NAC and Southern NEAC non-maturing 1SW fish at West Greenland can be calculated by dividing the estimated continent of origin reported harvest of 1SW salmon at West Greenland by the PFA estimate for the corresponding year for each stock complex. Exploitation rates are available for the 1971 to 2018 PFA years (Figure 5.1.3.1). The most recent estimate of exploitation available is for the 2018 fishery as the 2019 exploitation rate estimates are dependent on the 2019 PFA estimates, which depends on 2020 2SW returns. NAC PFA estimates (Table 4.3.6.1) are provided for August of the PFA year and Southern NEAC PFA estimates (Table 3.3.4.4) are provided for January of the PFA year, the latter adjusted by seven months (1 January to 1 August) of natural mortality at 0.03 per month. The 2018 NAC exploitation rate was 12.9%, which was an increase over the 2017 estimate (5.9%) and greater than the previous five-year mean (7.9%, 2013–2017). It remains among the lowest in the time-series, but within the range of exploitation estimates calculated since the early 2000s. NAC exploitation rate peaked in 1971 at approximately 41%. The 2018 Southern NEAC exploitation rate of 0.7% is approximate to the 2017 estimate (0.7%) and the previous five-year mean (0.8%, 2013–2017). The 2018 estimate remains one of the lowest in the time-series. Southern NEAC exploitation rate at Greenland peaked in 1975 at 33%. It should be noted that annual estimates of exploitation vary slightly from year to year, as they are dependent on the output from the run–reconstruction models, which vary slightly from assessment to assessment (see Sections 4.3.6 and 3.3.1).

5.2 International sampling programme

The international sampling programme for the fishery at West Greenland agreed by the parties at NASCO continued in 2019 (NASCO 2019; see WGC(19)06). The sampling was undertaken by participants from Canada (1), Ireland (2), UK (Northern Ireland) (1), UK (England and Wales) (1), USA (1), and Greenland (1). Sampling began on 16 August and continued through 24 September 2019.

Samplers were stationed in three communities (Figure 5.1.1.1) representing three NAFO Divisions: Sisimiut (NAFO division 1B), Maniitsoq (1C), and Qaqortoq (1F). Samples were also collected in Nuuk (1D) by an employee of the Greenland Institute of Natural Resources (GINR). Samples (n=68) were collected from the Nuuk fish market on two dates (September 10 and 20) and this is the first time that samples have been collected from Nuuk since 2011. As in previous years, no sampling occurred in the fishery in East Greenland. No sampling occurred at any factories as factory landings were not allowed in 2019. Tissue and biological samples were collected from all sampled fish.

A total of 1340 salmon were observed by the sampling teams, approximately 13% by weight of the reported landings. Of this total, 1119 were sampled for biological characteristics, 85 fish were only checked for an adipose clip, and 136 were documented as being landed, but were not sampled or examined further. A total of 1117 fork lengths, 1052 weights, 1049 scale samples for age determination, and 1119 tissue samples were collected, of which 1071 were analysed for continent and region of origin (Table 5.2.1).

A total of 20 adipose fin-clipped fish were recorded, no internal or external tags were identified by the samplers. A single external tag of Canadian origin was returned directly to the GINR in 2019. The stock origin and release location has yet to be determined.

Starting in 2002, non-reporting of harvest was evident based on a comparison of reported landings and sample data. In at least one of the NAFO Divisions where international samplers were present, the sampling team observed more fish than were reported as being landed for the whole season. When there is this type of discrepancy, the reported landings are adjusted ("Adjusted landings (sampling)") according to the estimated total weight of the fish identified as being landed during the sampling effort and these adjusted landings are carried forward for assessments. Adjusted landings do not replace the official reported statistics (Tables 5.1.1.1 and 5.1.1.2).

The time-series of reported landings and subsequent adjusted landings (sampling) for 2002–2019 are presented in Table 5.2.2. In most years, with the exception of 2006, 2011, 2015, 2018 and 2019, discrepancies were identified, although sometimes minor in magnitude. It should be noted that samplers are only stationed within selected communities for 2–6 weeks in total per year whereas the fishing season runs for 10–12 weeks. It is not possible to correct for non-reporting for an entire fishing season or area given the discrepancy in sampling coverage vs. fishing season without more accurate daily/weekly catch statistics. Landings for assessment are presented in Table 5.1.2.1.

As part of the international sampling programme agreed to by NASCO (NASCO 2019; see WGC(19)06) the Government of Greenland, in cooperation with the GINR, agreed to provide a local sampler to sample Atlantic salmon from Nuuk on a weekly basis during the 2018–2020 fishing seasons. As noted above, an employee of the GINR collected samples from the local fish market on two dates in 2019. The samples were collected from discarded fish carcasses, post-filleting, and therefore scale samples and weight measures were not collected.

The Working Group was informed that sampling at the Nuuk fish market poses particular challenges as the market is a modern structure with stricter access regulations compared to markets in other communities. As a result, the GINR is working with the market manager to develop a system where fish will be available for sampling on a more regular basis. Samples will likely continue to be collected from discarded carcasses, post-filleting. Although the Working Group would prefer that the full suite of samples and biological characteristics data be collected from every fish, this arrangement will likely result in only length and tissues samples being collected. The Working Group considers this an adequate compromise considering the abundance of scale and weight data collected from other sampled communities and the value of increasing and expanding the sample size for the region of origin assignments.

The Working Group notes that this is the first time samples have been collected from Nuuk since 2011, and encourages the Government of Greenland and GINR to continue this effort and to investigate options for collecting the full suite of biological characteristics data and samples on all sampled fish across the entire fishing season. The Working Group recommends that consideration be given to expanding the whole sampling programme to provide improved spatial and temporal coverage to more accurately estimate continent and region of origin and biological characteristics of the mixed-stock fishery.

5.2.1 Biological characteristics of the catches

The mean length and whole weight of North American 1SW salmon was 63.9 cm and 2.93 kg and the means for European 1SW salmon were 63.4 cm and 2.89 kg, similar to 2018 and the previous 10-year means (Table 5.2.1.1). The mean length and weight data reported in Table 5.2.1.1 have not been adjusted for the period of sampling and it is known that salmon grow quickly during the period of feeding and while in the fishery at West Greenland. Preliminary analyses to adjust for period of sampling have been previously reported (ICES, 2011; ICES, 2015a) and therefore caution is urged when interpreting the uncorrected data.

North American salmon sampled from the fishery at West Greenland were predominantly river age two (26.9%), three (32.5%) and four (25.4%) year old fish (Table 5.2.1.2). European salmon were predominantly river age two (60.5%) and three (24.2%) year old fish (Table 5.2.1.3). As expected, the 1SW age group dominated the 2019 sample collection for both the North American (95.9%) and European (97.9%) origin fish (Table 5.2.1.4).

5.2.2 Continent and region of origin of catches at West Greenland

In 2019, 1071 of 1119 tissue samples collected from four communities in four NAFO Divisions were genetically analysed: Sisimiut in 1B (n = 365 of 371), Maniitsoq in 1C (n = 423 of 427), Nuuk in 1D (n = 36 of 68), and Qaqortoq in 1F (n = 247 of 253, Figure 5.2.2.1 and Table 5.2.2.1).

Since 2017, a Single Nucleotide Polymorphism (SNP) range-wide baseline (Jeffery *et al.*, 2018) providing 20 North American and eight European reporting groups has been used for continent and region of origin analysis. The baseline has been revised, resulting in 21 North American and ten European reporting groups (Table 5.2.2.2 and Figure 5.2.2.2; ICES 2019). A Bayesian approach is used to estimate mixture composition or assign individuals to continent and region of origin. The approach uses the R package rubias (Anderson *et al.*, 2008).

In total, 71.5% of the salmon sampled in 2019 were of North American origin and 28.5% were of European origin (Table 5.2.2.1). These findings show that large proportions of fish from the North American stock complex continue to contribute to the fishery (Table 5.2.2.3 and Figure 5.2.2.3). The NAFO division-specific continent of origin assignments for 2019 are presented in Table 5.2.2.1 and Figure 5.2.2.4. The annual variation in the continental representation among divisions within the recent time-series (Figure 5.2.2.5) underscores the need to sample multiple NAFO Divisions to achieve the most accurate estimate of the contribution of fish from each continent to the mixed-stock fishery.

The estimated weighted proportions of North American and European salmon since 1982 and the weighted numbers of North American and European salmon caught at West Greenland (excluding unreported catch and reported harvest from ICES Area 14) are provided in Table 5.2.2.3 and Figure 5.2.2.6. Approximately 6800 (20.3 t) North American origin fish and approximately 2600 (8.1 t) European origin fish were harvested in 2019. The 2019 total number of fish harvested (9400) is a decrease from the 2018 estimate (13 200).

The Working Group has previously reported on the region of origin of catches at West Greenland, both for North American and European origin salmon (ICES, 2019). Region of origin estimates for the 2019 fishery, based on the updated range-wide SNP baseline, are provided in Table 5.2.2.4 and Figure 5.2.2.7. Assignment of an individual to a reporting group is determined based on 80% likelihood or higher.

The North American contributions to the West Greenland fishery are dominated by the Gaspe Peninsula, the Gulf of St Lawrence, and the Labrador South reporting groups. These three groups accounted for 65% of the North American contributions in 2019. The Northeast Atlantic contributions were dominated by the United Kingdom/Ireland reporting group (99% of the European contributions in 2019).

From North America, there are smaller (0.1–5.4%), but consistent contributions to the harvest for a number of other reporting groups including the southern regions of NAC (Figure 5.2.2.7 and Table 5.2.2.4). Within the European contributions, all other reporting groups were estimated to contribute 0–0.2% to the overall harvest. These results support the previous conclusion by ICES (2017) that stocks from Northern NEAC do not contribute a significant amount to the harvest at West Greenland. Further, the variation in NAFO division-specific region of origin assignments highlight the variation of region-specific contributions across years and NAFO divisions.

In 2018 for the first time, a single sample was identified as having originated from the Greenland (i.e. Kapisillit River) reporting group. No individuals were identified as having originated from the Greenland reporting group in 2019.

5.3 NASCO has requested ICES to describe the status of the stocks

The stocks contributing to the Greenland fishery are the NAC 2SW and Southern NEAC MSW complexes. The midpoints of the spawner abundance estimates for the seven stock complexes exploited at West Greenland are below CLs in 2019 (Figure 5.3.1). A more detailed overview of status of stocks in the NEAC and NAC areas is presented in the relevant Commission sections (Sections 3 and 4).

5.3.1 North American stock complex

The total estimate of 2SW salmon spawners in North America for 2019 decreased by 29% from the 2018 revised estimate, and is the 5th lowest of the 49-year time-series. The midpoints of the spawner abundance estimates were below the CLs for all regions of NAC and are therefore suffering reduced reproductive capacity (Figure 4.3.2.4). The proportion of the 2SW CL attained from 2SW spawners was 50% for Labrador, 75% for Newfoundland, 61% for Québec, 77% for the Gulf region, and 3% and 4% (6% and 27% of the management objectives) for Scotia-Fundy and USA, respectively. Within each of the geographic areas, there are individual river stocks which are failing to meet CLs (Table 4.3.4.1 and Figure 4.3.4.2). In the southern areas of NAC (Scotia-Fundy and USA) there are numerous populations at high risk of extinction and these are under consideration or receiving special protections under federal legislation. The estimated exploitation rate of salmon in North American fisheries has declined (Figure 4.1.6.1) from a peak of 81% in 1971 for 2SW salmon to a mean of 10% over the past ten years.

5.3.2 MSW Southern European stock complex

The midpoint of the spawner abundance estimate for the Southern NEAC MSW stock complex was below the CL and is therefore suffering reduced reproductive capacity (Figure 3.3.4.2). Individual countries stock status within the NEAC MSW stock complex varied across all three stock status designations (Figure 3.3.4.5). Note that rivers in the south and west of Iceland are included in the assessment of the Southern NEAC stock complex. Within individual jurisdictions, there are large numbers of rivers not meeting CLs after homewater fisheries (Table 3.3.5.1 and Figure 3.3.5.1). Homewater exploitation rates on the MSW Southern NEAC stock complex are shown in Figure 3.1.9.1. Exploitation on MSW fish in Southern NEAC was 4% in 2019, which was lower than the previous five year (11%) and ten year (12%) means.

Table 5.1.1.1. Nominal catches of salmon at West Greenland since 1960 (t round fresh weight) by participating nations. For Greenlandic vessels specifically, all catches up to 1968 were taken with set gillnets only and catches after 1968 were taken with set gillnets and driftnets. All non-Greenlandic vessel catches from 1969–1975 were taken with driftnets. The quota figures applied to Greenlandic vessels only and parenthetical entries identify when quotas did not apply to all sectors of the fishery.

Year	Norway	Faroes	Sweden	Denmark	Greenland	Total	Quota	Comments
1960	-	-	-	-	60	60		
1961	-	-	-	-	127	127		
1962	-	-	-	-	244	244		
1963	-	-	-	-	466	466		
1964	-	-	-	-	1539	1539		
1965	-	36	-	-	825	858		Norwegian harvest figures not available, but known to be less than Faroese catch
1966	32	87	-	-	1251	1370		
1967	78	155	-	85	1283	1601		
1968	138	134	4	272	579	1127		
1969	250	215	30	355	1360	2210		
1970	270	259	8	358	1244	2139		Greenlandic total includes 7 t caught by longlines in the Labrador Sea
1971	340	255	-	645	1449	2689	-	
1972	158	144	-	401	1410	2113	1100	
1973	200	171	-	385	1585	2341	1100	
1974	140	110	-	505	1162	1917	1191	
1975	217	260	-	382	1171	2030	1191	
1976	-	-	-	-	1175	1175	1191	
1977	-	-	-	-	1420	1420	1191	
1978	-	-	-	-	984	984	1191	
1979	-	-	-	-	1395	1395	1191	
1980	-	-	-	-	1194	1194	1191	
1981	-	-	-	-	1264	1264	1265	Quota set to a specific opening date for the fishery
1982	-	-	-	-	1077	1077	1253	Quota set to a specific opening date for the fishery
1983	-	-	-	-	310	310	1191	
1984	-	-	-	-	297	297	870	

Year	Norway	Faroes	Sweden	Denmark	Greenland	Total	Quota	Comments
1985	-	-	-	-	864	864	852	
1986	-	-	-	-	960	960	909	
1987	-	-	-	-	966	966	935	
1988	-	-	-	-	893	893	840	Quota for 1988–1990 was 2520 t with an opening date of August 1. Annual catches were not to exceed an annual average (840 t) by more than 10%. Quota adjusted to 900 t in 1989 and 924 t in 1990 for later opening dates.
1989	-	-	-	-	337	337	900	
1990	-	-	-	-	274	274	924	
1991	-	-	-	-	472	472	840	
1992	-	-	-	-	237	237	258	Quota set by Greenland authorities
1993	-	-	-	-			89	The fishery was suspended. NASCO adopt a new quota allocation model.
1994	-	-	-	-			137	The fishery was suspended and the quotas were bought out.
1995	-	-	-	-	83	83	77	Quota advised by NASCO
1996	-	-	-	-	92	92	174	Quota set by Greenland authorities
1997	-	-	-	-	58	58	57	Private (non-commercial) catches to be reported after 1997
1998	-	-	-	-	11	11	20	Fishery restricted to catches used for internal consumption in Greenland
1999	-	-	-	-	19	19	20	
2000	-	-	-	-	21	21	20	
2001	-	-	-	-	43	43	114	Final quota calculated according to the ad hoc management system
2002	-	-	-	-	9	9	55	Quota bought out, quota represented the maximum allowable catch (no factory landing allowed), and higher catch figures based on sampling programme information are used for the assessments
2003	-	-	-	-	9	9		Quota set to nil (no factory landing allowed), fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information are used for the assessments
2004	-	-	-	-	15	15		same as previous year
2005	-	-	-	-	15	15		same as previous year

Year	Norway	Faroes	Sweden	Denmark	Greenland	Total	Quota	Comments
2006	-	-	-	-	22	22		Quota set to nil (no factory landing allowed) and fishery restricted to catches used for internal consumption in Greenland
2007	-	-	-	-	25	25		Quota set to nil (no factory landing allowed), fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information are used for the assessments
2008	-	-	-	-	26	26		same as previous year
2009	-	-	-	-	26	26		same as previous year
2010	-	-	-	-	40	40		No factory landing allowed and fishery restricted to catches used for internal consumption in Greenland
2011	-	-	-	-	28	28		same as previous
2012	-	-	-	-	33	33	(35)	Unilateral decision made by Greenland to allow factory landing with a 35 t quota for factory landings only, fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information are used for the assessments
2013	-	-	-	-	47	47	(35)	same as previous year
2014	-	-	-	-	58	58	(30)	Unilateral decision made by Greenland to allow factory landing with a 30 t quota for factory landings only, fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information and phone surveys are used for the assessments
2015	-	-	-	-	57	57	45	Unilateral decision made by Greenland to set a 45 t quota for all sectors of the fishery, fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information and phone surveys are used for the assessments
2016	-	-	-	-	27	27	32	Unilateral decision made by Greenland to reduce the previously set 45 t quota for all sectors of the fishery to 32 t based on overharvest of 2015 fishery, fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information and phone surveys are used for the assessments
2017	-	-	-	-	28	28	45	Unilateral decision made by Greenland to set a 45 t quota for all sectors of the fishery, fishery restricted to catches used for internal consumption in Greenland, and higher catch figures based on sampling programme information are used for the assessments
2018	-	-	-	-	40	40	30	No factory landing allowed and fishery restricted to catches used for internal consumption in Greenland
2019	-	-	-	-	30	30	19.5	same as previous year

Table 5.1.1.2. Distribution of nominal catches (t) by Greenland vessels since 1960. NAFO Division is represented by 1A–1F. Since 2005, gutted weights have been reported and converted to total weight by a factor of 1.11. Rounding issues are evident for some totals.

Year	1A	1B	1C	1D	1E	1F	Unk.	West Greenland	East Greenland	Total
1960							60	60		60
1961							127	127		127
1962							244	244		244
1963	1	172	180	68	45			466		466
1964	21	326	564	182	339	107		1539		1539
1965	19	234	274	86	202	10	36	861		861
1966	17	223	321	207	353	130	87	1338		1338
1967	2	205	382	228	336	125	236	1514		1514
1968	1	90	241	125	70	34	272	833		833
1969	41	396	245	234	370		867	2153		2153
1970	58	239	122	123	496	207	862	2107		2107
1971	144	355	724	302	410	159	560	2654		2654
1972	117	136	190	374	385	118	703	2023		2023
1973	220	271	262	440	619	329	200	2341		2341
1974	44	175	272	298	395	88	645	1917		1917
1975	147	468	212	224	352	185	442	2030		2030
1976	166	302	262	225	182	38		1175		1175
1977	201	393	336	207	237	46	-	1 420	6	1426
1978	81	349	245	186	113	10	-	984	8	992
1979	120	343	524	213	164	31	-	1 395	+	1395
1980	52	275	404	231	158	74	-	1 194	+	1194
1981	105	403	348	203	153	32	20	1 264	+	1264
1982	111	330	239	136	167	76	18	1 077	+	1077
1983	14	77	93	41	55	30	-	310	+	310
1984	33	116	64	4	43	32	5	297	+	297
1985	85	124	198	207	147	103	-	864	7	871
1986	46	73	128	203	233	277	-	960	19	979
1987	48	114	229	205	261	109	-	966	+	966

Year	1A	1B	1C	1D	1E	1F	Unk.	West Greenland	East Greenland	Total
1988	24	100	213	191	198	167	-	893	4	897
1989	9	28	81	73	75	71	-	337	-	337
1990	4	20	132	54	16	48	-	274	-	274
1991	12	36	120	38	108	158	-	472	4	476
1992	-	4	23	5	75	130	-	237	5	242
1993 [1]	-	-	-	-	-	-	-	-	-	-
1994 [1]	-	-	-	-	-	-	-	-	-	-
1995	+	10	28	17	22	5	-	83	2	85
1996	+	+	50	8	23	10	-	92	+	92
1997	1	5	15	4	16	17	-	58	1	59
1998	1	2	2	4	1	2	-	11	-	11
1999	+	2	3	9	2	2	-	19	+	19
2000	+	+	1	7	+	13	-	21	-	21
2001	+	1	4	5	3	28	-	43	-	43
2002	+	+	2	4	1	2	-	9	-	9
2003	1	+	2	1	1	5	-	9	-	9
2004	3	1	4	2	3	2	-	15	-	15
2005	1	3	2	1	3	5	-	15	-	15
2006	6	2	3	4	2	4	-	22	-	22
2007	2	5	6	4	5	2	-	25	-	25
2008	4.9	2.2	10.0	1.6	2.5	5.0	0	26.2	0	26.2
2009	0.2	6.2	7.1	3.0	4.3	4.8	0	25.6	0.8	26.3
2010	17.3	4.6	2.4	2.7	6.8	4.3	0	38.1	1.7	39.6
2011	1.8	3.7	5.3	8.0	4.0	4.6	0	27.4	0.1	27.5
2012	5.4	0.8	15.0	4.6	4.0	3.0	0	32.6	0.5	33.1
2013	3.1	2.4	17.9	13.4	6.4	3.8	0	47.0	0.0	47.0
2014	3.6	2.8	13.8	19.1	15.0	3.4	0	57.8	0.1	57.9
2015	0.8	8.8	10.0	18.0	4.2	14.1	0	55.9	1.0	56.8
2016	0.8	1.2	7.3	4.6	4.5	7.3	0	25.7	1.5	27.1

Year	1A	1B	1C	1D	1E	1F	Unk.	West Greenland	East Greenland	Total
2017	1.1	1.7	9.3	6.9	3.2	5.6	0	27.8	0.3	28.0
2018	2.4	5.7	13.7	8.2	4.2	4.8	0	39.0	0.8	39.9
2019	0.8	3.0	4.4	8.0	4.8	7.3	0	28.3	1.4	29.8

1 The fishery was suspended.

+ Small catches <5 t.

- No catch.

Table 5.1.1.3. Reported landings (t) by licence type, landing category, the number of fishers reporting and the total number of landing reports received in 2019. Empty cells identify categories with no reported landings and 0.0 entries represents reported values of <0.1. Rounding issues are evident for some totals.

NAFO/ICES	Licence type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total
1A	Private	42	60		0.1		0.1
1A	Commercial	54	105	0.7			0.7
1A	**TOTAL**	**96**	**165**	**0.7**	**0.1**		**0.8**
1B	Private	35	62	0.1	0.4		0.5
1B	Commercial	34	126	2.5	0.0		2.6
1B	**TOTAL**	**70**	**191**	**2.6**	**0.4**		**3.0**
1C	Private	29	40	0.1	0.2		0.3
1C	Commercial	88	176	4.0	0.0		4.0
1C	**TOTAL**	**117**	**216**	**4.1**	**0.3**		**4.4**
1D	Private	136	176	0.0	1.2		1.3
1D	Commercial	33	98	6.7	0.0		6.8
1D	**TOTAL**	**169**	**274**	**6.8**	**1.2**		**8.0**
1E	Private	31	106		2.0		2.0
1E	Commercial	23	110	2.8	0.0		2.9
1E	**TOTAL**	**54**	**216**	**2.8**	**2.0**		**4.8**
1F	Private	70	228	0.0	2.8		2.9
1F	Commercial	38	145	4.5			4.5
1F	**TOTAL**	**108**	**373**	**4.5**	**2.8**		**7.3**
XIV	Private	18	65		1.0		1.0
XIV	Commercial	6	31	0.5			0.5
XIV	**TOTAL**	**24**	**96**	**0.5**	**1.0**		**1.4**
ALL	Private	361	737	0.2	7.6		7.9
ALL	Commercial	276	791	21.8	0.1		21.9
ALL	**TOTAL**	**637**	**1531**	**22.0**	**7.7**		**29.8**

Table 5.1.1.4. Reported landings (t) by landing category, the number of fishers reporting and the total number of landing reports received for licensed and unlicensed fishers in 2017 and 2018. Empty cells identify categories with no reported landings and 0.0 entries represents reported values of <0.1. Rounding issues are evident for some totals.

NAFO/ICES	Licence Type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total	Licensed	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total
	2018							**2017**						
1A	Private	35	58	0.0	0.2		0.2	NO	2	12				
1A	Commercial	63	177	2.2	0.0		2.2	YES	15	66	0.3	0.8		1.1
1A	**TOTAL**	**98**	**235**	**2.2**	**0.2**		**2.4**	**TOTAL**	**17**	**78**	**0.3**	**0.9**		**1.1**
1B	Private	47	105		1.0		1.0	NO						
1B	Commercial	31	125	4.6			4.6	YES	9	40	1.4	0.2		1.7
1B	**TOTAL**	**78**	**230**	**4.6**	**1.0**		**5.7**	**TOTAL**	**9**	**40**	**1.4**	**0.2**		**1.7**
1C	Private	25	51		0.8		0.8	NO	7	23		0.4		0.4
1C	Commercial	56	200	12.9			12.9	YES	33	135	5.9	3		8.9
1C	**TOTAL**	**81**	**251**	**12.9**	**0.8**		**13.7**	**TOTAL**	**40**	**158**	**5.9**	**3.4**		**9.3**
1D	Private	125	163	0.0	1.4		1.4	NO	17	44		0.9		0.9
1D	Commercial	18	120	6.8			6.8	YES	7	23	5.1	0.9		5.9
1D	**TOTAL**	**143**	**283**	**6.8**	**1.4**		**8.2**	**TOTAL**	**24**	**67**	**5.1**	**1.8**		**6.9**
1E	Private	20	86		1.5		1.5	NO	8	24		0.6		0.6
1E	Commercial	24	98	2.7	0.1		2.8	YES	15	114	0.7	1.9		2.6
1E	**TOTAL**	**44**	**184**	**2.7**	**1.6**		**4.2**	**TOTAL**	**23**	**138**	**0.7**	**2.5**		**3.2**

NAFO/ICES	Licence Type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total	Licensed	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total
1F	Private	65	169		2.0		2.0	NO	16	51		1.2		1.2
1F	Commercial	40	130	2.8			2.8	YES	12	78	1.8	2.6		4.4
1F	**TOTAL**	**105**	**299**	**2.8**	**2.0**		**4.8**	**TOTAL**	**28**	**129**	**1.8**	**3.8**		**5.6**
XIV	Private	5	42		0.4		0.4	NO						
XIV	Commercial	3	12	0.4			0.4	YES	2	21	0.1	0.2		0.3
XIV	**TOTAL**	**8**	**54**	**0.4**	**0.4**		**0.8**	**TOTAL**	**2**	**21**	**0.1**	**0.2**		**0.3**
ALL	Private	322	674	0.0	7.2		7.3	NO	50	154		3.1		3.1
ALL	Commercial	235	862	32.5	0.1		32.6	YES	93	477	15.3	9.7		24.9
ALL	**TOTAL**	**557**	**1536**	**32.5**	**7.4**		**39.9**	**TOTAL**	**143**	**631**	**15.3**	**12.7**		**28.0**

Table 5.1.1.5. Total number of licences issued by NAFO (1A-1F)/ICES Divisions and the number of people reporting catches of Atlantic salmon in the Greenland fishery. Reports received by fish plants prior to 1997 and to the Licence Office from 1998 to present. Blanks cells indicate that the data were not reported or available. Starting in 2018, a new regulation was enacted which required all fishers to have a licence to fish for Atlantic salmon. Prior to 2018, only commercial fishers were required to have a licence.

Year	Licences	1A	1B	1C	1D	1E	1F	ICES	Unk.	Number of fishers reporting	Number of reports received
1987		78	67	74		99	233		0	579	
1988		63	46	43	53	78	227		0	516	
1989		30	41	98	46	46	131		0	393	
1990		32	15	46	52	54	155		0	362	
1991		53	39	100	41	54	123		0	410	
1992		3	9	73	9	36	82		0	212	
1993											
1994											
1995		0	17	52	21	24	31		0	145	
1996		1	8	74	15	23	42		0	163	
1997		0	16	50	7	2	6		0	80	
1998		16	5	8	7	3	30		0	69	
1999		3	8	24	18	21	29		0	102	
2000		1	1	5	12	2	25		0	43	
2001	452	2	7	13	15	6	37		0	76	
2002	479	1	1	9	13	9	8		0	41	
2003	150	11	1	4	4	12	10		0	42	
2004	155	20	2	8	4	20	12		0	66	
2005	185	11	7	17	5	17	18		0	75	
2006	159	43	14	17	20	17	30		0	141	
2007	260	29	12	26	10	33	22		0	132	
2008	260	44	8	41	10	16	24		0	143	
2009	294	19	11	35	15	25	31	9	0	145	
2010	309	86	17	19	16	30	27	13	0	208	389
2011	234	25	9	20	15	20	23	5	0	117	394

Year	Licences	1A	1B	1C	1D	1E	1F	ICES	Unk.	Number of fishers reporting	Number of reports received
2012	279	35	9	32	8	16	16	6	0	122	553
2013	228	28	8	21	19	7	11	1	0	95	553
2014	321	21	8	40	20	10	14	1	0	114	669
2015	310	18	18	58	31	14	41	9	0	189	938
2016	263	9	11	31	16	23	40	10	3	143	503
2017	282	17	9	40	24	23	28	2	0	143	631
2018	786	98	78	81	143	44	105	8	0	557	1536
2019	717	96	70	117	169	54	108	24	0	637	1531

Table 5.1.2.1. Adjusted landings estimated from comparing the weight of salmon seen by the sampling teams and the corresponding community-specific reported landings (Adjusted landings (sampling)) and from phone surveys (Adjusted landings (survey)). Dashes '-' indicate that no adjustment was necessary or that a phone surveys was not conducted. Adjusted landings (sampling and surveys) are added to the reported landings and estimated unreported catch for assessment purposes. Adjusted landings do not replace official reported statistics. Rounding issues are evident for some totals.

Year	Reported Landings (West Greenland only)	Adjusted Landings (Sampling)	Adjusted Landings (Survey)	Landings for Assessment
2002	9.0	0.7	-	9.8
2003	8.7	3.6	-	12.3
2004	14.7	2.5	-	17.2
2005	15.3	2.0	-	17.3
2006	23.0	-	-	23.0
2007	24.6	0.2	-	24.8
2008	26.1	2.5	-	28.6
2009	25.5	2.5	-	28.0
2010	37.9	5.1	-	43.1
2011	27.4	-	-	27.4
2012	32.6	2.0	-	34.6
2013	46.9	0.7	-	47.7
2014	57.7	0.6	12.2	70.5
2015	55.9	-	5.0	60.9
2016	25.7	0.3	4.2	30.2
2017	27.8	0.3	-	28.0
2018	39.0	-	-	39.0
2019	28.3	-	-	28.3

Table 5.2.1. Size of biological samples and percentage (by number) of North American and European salmon in research vessel catches at West Greenland (1969 to 1982), from commercial samples (1978 to 1992, 1995 to 1997, and 2001) and from local consumption samples (1998 to 2000, and 2002 to present). Parenthetical genetic sample numbers represent the number of samples available. Genetic-based continent of origin assignments are considered to be 100% accurate.

Source	Year	Sample Size			Continent of Origin (%)			
		Length	Scales	Genetics	North American	(95% CI)[1]	European	(95% CI)[1]
Research	1969	212	212		51	(57, 44)	49	(56, 43)
	1970	127	127		35	(43, 26)	65	(75, 57)
	1971	247	247		34	(40, 28)	66	(72, 50)
	1972	3488	3488		36	(37, 34)	64	(66, 63)
	1973	102	102		49	(59, 39)	51	(61, 41)
	1974	834	834		43	(46, 39)	57	(61, 54)
	1975	528	528		44	(48, 40)	56	(60, 52)
	1976	420	420		43	(48, 38)	57	(62, 52)
	1978[2]	606	606		38	(41, 38)	62	(66, 59)
	1978[3]	49	49		55	(69, 41)	45	(59, 31)
	1979	328	328		47	(52, 41)	53	(59, 48)
	1980	617	617		58	(62, 54)	42	(46, 38)
	1982	443	443		47	(52, 43)	53	(58, 48)
Commercial	1978	392	392		52	(57, 47)	48	(53, 43)
	1979	1653	1653		50	(52, 48)	50	(52, 48)
	1980	978	978		48	(51, 45)	52	(55, 49)
	1981	4570	1930		59	(61, 58)	41	(42, 39)
	1982	1949	414		62	(64, 60)	38	(40, 36)
	1983	4896	1815		40	(41, 38)	60	(62, 59)
	1984	7282	2720		50	(53, 47)	50	(53, 47)
	1985	13 272	2917		50	(53, 46)	50	(52, 34)
	1986	20 394	3509		57	(66, 48)	43	(52, 34)
	1987	13 425	2960		59	(63, 54)	41	(46, 37)
	1988	11 047	2562		43	(49, 38)	57	(62, 51)
	1989	9366	2227		56	(60, 52)	44	(48, 40)
	1990	4897	1208		75	(79, 70)	25	(30, 21)

Source	Year	Sample Size			Continent of Origin (%)			
		Length	Scales	Genetics	North American	(95% CI)[1]	European	(95% CI)[1]
	1991	5005	1347		65	(69, 61)	35	(39, 31)
	1992	6348	1648		54	(57, 50)	46	(50, 43)
	1995	2045	2045		68	(75, 65)	32	(35, 28)
	1996	3341	1397		73	(76, 71)	27	(29, 24)
	1997	794	282		80	(84, 75)	20	(25, 16)
	2001	4721	2655		69	(71, 67)	31	(33, 29)
Local Consumption	1998	540	406		79	(84, 73)	21	(27, 16)
	1999	532	532		90	(97, 84)	10	(16, 3)
	2000	491	491	490	70		30	
	2002	501	501	501 (1001)	68		32	
	2003	1743	1743	1779	68		32	
	2004	1639	1639	1688	73		27	
	2005	767	767	767	76		24	
	2006	1209	1209	1193	72		28	
	2007	1116	1110	1123	82		18	
	2008	1854	1866	1853	86		14	
	2009	1662	1683	1671	91		9	
	2010	1261	1265	1240	80		20	
	2011	967	965	964	92		8	
	2012	1372	1371	1373	82		18	
	2013	1155	1156	1149	82		18	
	2014	892	775	920	72		28	
	2015	1708	1704	1674	80		20	
	2016	1300	1240	1302	66		34	
	2017	1369	1328	986 (1367)	74		26	
	2018	1064	1048	979 (1111)	83		17	
	2019	1117	1049	1071 (1119)	72		28	

[1] CI - confidence interval calculated by method of Pella and Robertson (1979) for 1984–1986 and binomial distribution for the others. 2 During 1978 Fishery. 3 Research samples after 1978 fishery closed.

Table 5.2.2. Reported landings (kg) for the West Greenland Atlantic salmon fishery from 2002 to the present by NAFO division and the division-specific adjusted landings (sampling) where the sampling teams observed more fish landed than were reported. Adjusted landings (sampling) were not calculated for 2006, 2011, 2015, 2018 and 2019 as the sampling teams did not observe more fish than were reported. Shaded cells indicate that sampling took place in that year and division.

Year	Type	1A	1B	1C	1D	1E	1F	Total
2002	Reported	14	78	2100	3752	1417	1661	9022
	Adjusted						2408	9769
2003	Reported	619	17	1621	648	1274	4516	8694
	Adjusted			1782	2709		5912	12 312
2004	Reported	3476	611	3516	2433	2609	2068	14 712
	Adjusted				4929			17 209
2005	Reported	1294	3120	2240	756	2937	4956	15 303
	Adjusted				2730			17 276
2006	Reported	5427	2611	3424	4731	2636	4192	23 021
	Adjusted							
2007	Reported	2019	5089	6148	4470	4828	2093	24 647
	Adjusted						2252	24 806
2008	Reported	4882	2210	10024	1595	2457	4979	26 147
	Adjusted				3577		5478	28 627
2009	Reported	195	6151	7090	2988	4296	4777	25 496
	Adjusted				5466			27 975
2010	Reported	17 263	4558	2363	2747	6766	4252	37 949
	Adjusted		4824		6566		5274	43 056
2011	Reported	1858	3662	5274	7977	4021	4613	27 407
	Adjusted							
2012	Reported	5353	784	14 991	4564	3993	2951	32 636
	Adjusted		2001				3694	34 596
2013	Reported	3052	2358	17 950	13 356	6442	3774	46 933
	Adjusted		2461				4408	47 669
2014	Reported	3625	2756	13 762	19 123	14 979	3416	57 662
	Adjusted						4036	58 282
2015	Reported	751	8801	10 055	17 966	4170	14 134	55 877

Year	Type	1A	1B	1C	1D	1E	1F	Total
	Adjusted							
2016	Reported	763	1234	7271	4630	4492	7265	25 655
	Adjusted		1498					25 919
2017	Reported	1114	1665	9335	6858	3219	5563	27 754
	Adjusted		1942					28 031
2018	Reported	2434	5684	13 726	8202	4214	4788	39 048
	Adjusted							
2019	Reported	776	3036	4351	8027	4822	7321	28 333
	Adjusted							

Table 5.2.1.1. Annual mean whole weights (kg) and fork lengths (cm) by sea age and continent of origin of Atlantic salmon caught at West Greenland 1969 to the present, excluding 1977, 1993 and 1994 (NA = North America and E = Europe). These data have not been adjusted for the period of sampling and it is known that salmon grow quickly during the period of feeding and while in the fishery at West Greenland. Caution is urged when interpreting these uncorrected data. The 2017 and 2019 European origin previous spawner values are estimated from two and one fish respectively.

	Whole Weight (kg)									Fork Length (cm)					
	1SW		2SW		PS		All Sea Ages		Total	1SW		2SW		PS	
Year	NA	E	NA	E	NA	E	NA	E		NA	E	NA	E	NA	E
1969	3.12	3.76	5.48	5.80	-	5.13	3.25	3.86	3.58	65.0	68.7	77.0	80.3	-	75.3
1970	2.85	3.46	5.65	5.50	4.85	3.80	3.06	3.53	3.28	64.7	68.6	81.5	82.0	78.0	75.0
1971	2.65	3.38	4.30	-	-	-	2.68	3.38	3.14	62.8	67.7	72.0	-	-	-
1972	2.96	3.46	5.85	6.13	2.65	4.00	3.25	3.55	3.44	64.2	67.9	80.7	82.4	61.5	69.0
1973	3.28	4.54	9.47	10.00	-	-	3.83	4.66	4.18	64.5	70.4	88.0	96.0	61.5	-
1974	3.12	3.81	7.06	8.06	3.42	-	3.22	3.86	3.58	64.1	68.1	82.8	87.4	66.0	-
1975	2.58	3.42	6.12	6.23	2.60	4.80	2.65	3.48	3.12	61.7	67.5	80.6	82.2	66.0	75.0
1976	2.55	3.21	6.16	7.20	3.55	3.57	2.75	3.24	3.04	61.3	65.9	80.7	87.5	72.0	70.7
1977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1978	2.96	3.50	7.00	7.90	2.45	6.60	3.04	3.53	3.35	63.7	67.3	83.6	-	60.8	85.0
1979	2.98	3.50	7.06	7.60	3.92	6.33	3.12	3.56	3.34	63.4	66.7	81.6	85.3	61.9	82.0
1980	2.98	3.33	6.82	6.73	3.55	3.90	3.07	3.38	3.22	64.0	66.3	82.9	83.0	67.0	70.9
1981	2.77	3.48	6.93	7.42	4.12	3.65	2.89	3.58	3.17	62.3	66.7	82.8	84.5	72.5	-
1982	2.79	3.21	5.59	5.59	3.96	5.66	2.92	3.43	3.11	62.7	66.2	78.4	77.8	71.4	80.9
1983	2.54	3.01	5.79	5.86	3.37	3.55	3.02	3.14	3.10	61.5	65.4	81.1	81.5	68.2	70.5
1984	2.64	2.84	5.84	5.77	3.62	5.78	3.20	3.03	3.11	62.3	63.9	80.7	80.0	69.8	79.5
1985	2.50	2.89	5.42	5.45	5.20	4.97	2.72	3.01	2.87	61.2	64.3	78.9	78.6	79.1	77.0
1986	2.75	3.13	6.44	6.08	3.32	4.37	2.89	3.19	3.03	62.8	65.1	80.7	79.8	66.5	73.4
1987	3.00	3.20	6.36	5.96	4.69	4.70	3.10	3.26	3.16	64.2	65.6	81.2	79.6	74.8	74.8
1988	2.83	3.36	6.77	6.78	4.75	4.64	2.93	3.41	3.18	63.0	66.6	82.1	82.4	74.7	73.8
1989	2.56	2.86	5.87	5.77	4.23	5.83	2.77	2.99	2.87	62.3	64.5	80.8	81.0	73.8	82.2
1990	2.53	2.61	6.47	5.78	3.90	5.09	2.67	2.72	2.69	62.3	62.7	83.4	81.1	72.6	78.6
1991	2.42	2.54	5.82	6.23	5.15	5.09	2.57	2.79	2.65	61.6	62.7	80.6	82.2	81.7	80.0
1992	2.54	2.66	6.49	6.01	4.09	5.28	2.86	2.74	2.81	62.3	63.2	83.4	81.1	77.4	82.7
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	2.37	2.67	6.09	5.88	3.71	4.98	2.45	2.75	2.56	61.0	63.2	81.3	81.0	70.9	81.3

	Whole Weight (kg)									Fork Length (cm)					
	1SW		2SW		PS		All Sea Ages		Total	1SW		2SW		PS	
Year	NA	E	NA	E	NA	E	NA	E		NA	E	NA	E	NA	E
1996	2.63	2.86	6.50	6.30	4.98	5.44	2.83	2.90	2.88	62.8	64.0	81.4	81.1	77.1	79.4
1997	2.57	2.82	7.95	6.11	4.82	6.9	2.63	2.84	2.71	62.3	63.6	85.7	84.0	79.4	87.0
1998	2.72	2.83	6.44	-	3.28	4.77	2.76	2.84	2.78	62.0	62.7	84.0	-	66.3	76.0
1999	3.02	3.03	7.59	-	4.20	-	3.09	3.03	3.08	63.8	63.5	86.6	-	70.9	-
2000	2.47	2.81	-	-	2.58	-	2.47	2.81	2.57	60.7	63.2	-	-	64.7	-
2001	2.89	3.03	6.76	5.96	4.41	4.06	2.95	3.09	3.00	63.1	63.7	81.7	79.1	75.3	72.1
2002	2.84	2.92	7.12	-	5.00	-	2.89	2.92	2.90	62.6	62.1	83.0	-	75.8	-
2003	2.94	3.08	8.82	5.58	4.04	-	3.02	3.10	3.04	63	64.4	86.1	78.3	71.4	-
2004	3.11	2.95	7.33	5.22	4.71	6.48	3.17	3.22	3.18	64.7	65.0	86.2	76.4	77.6	88.0
2005	3.19	3.33	7.05	4.19	4.31	2.89	3.31	3.33	3.31	65.9	66.4	83.3	75.5	73.7	62.3
2006	3.10	3.25	9.72	-	5.05	3.67	3.25	3.26	3.24	65.3	65.3	90.0	-	76.8	69.5
2007	2.89	2.87	6.19	6.47	4.94	3.57	2.98	2.99	2.98	63.5	63.3	80.9	80.6	76.7	71.3
2008	3.04	3.03	6.35	7.47	3.82	3.39	3.08	3.07	3.08	64.6	63.9	80.1	85.5	71.1	73.0
2009	3.28	3.40	7.59	6.54	5.25	4.28	3.48	3.67	3.50	64.9	65.5	84.6	81.7	75.9	73.5
2010	3.44	3.24	6.40	5.45	4.17	3.92	3.47	3.28	3.42	66.7	65.2	80.0	75.0	72.4	70.0
2011	3.30	3.18	5.69	4.94	4.46	5.11	3.39	3.49	3.40	65.8	64.7	78.6	75.0	73.7	76.3
2012	3.34	3.38	6.00	4.51	4.65	3.65	3.44	3.40	3.44	65.4	64.9	75.9	70.4	72.8	68.9
2013	3.33	3.16	6.43	4.51	3.64	5.38	3.39	3.20	3.35	66.2	64.6	81.0	72.8	69.9	73.6
2014	3.25	3.02	7.60	6.00	4.47	5.42	3.39	3.13	3.32	65.6	64.7	86.0	78.7	73.6	83.5
2015	3.36	3.13	7.52	7.1	4.53	3.81	3.42	3.18	3.37	65.6	64.4	84.1	82.5	74.2	67.2
2016	3.18	2.79	7.77	5.18	4.03	4.12	3.32	2.89	3.18	65.2	62.6	85.1	76.0	72.2	70.9
2017	3.42	3.31	6.50	3.69	4.94	8.00	3.50	3.36	3.26	66.6	64.8	85.1	72.4	76.7	81.9
2018	2.91	2.93	9.27	5.59	4.53	-	2.97	3.00	2.97	63.8	63.9	87.5	76.3	77.1	-
2019	2.93	2.89	6.62	6.27	4.01	2.76	3.01	2.83	2.96	63.9	63.4	78.4	76.8	72.1	62.1
Prev. 10-yr mean	3.28	3.15	7.08	5.35	4.47	4.85	3.38	3.26	3.34	65.6	64.5	82.8	76.1	73.9	74.0
Overall mean	2.90	3.15	6.72	6.11	4.13	4.73	3.04	3.23	3.14	63.6	65.1	82.2	80.4	72.1	75.5

Table 5.2.1.2. River age distribution (%) and mean river age for all North American origin salmon caught at West Greenland from 1968 to the present, excluding 1977, 1993 and 1994.

Year	1	2	3	4	5	6	7	8
1968	0.3	19.6	40.4	21.3	16.2	2.2	0	0
1969	0	27.1	45.8	19.6	6.5	0.9	0	0
1970	0	58.1	25.6	11.6	2.3	2.3	0	0
1971	1.2	32.9	36.5	16.5	9.4	3.5	0	0
1972	0.8	31.9	51.4	10.6	3.9	1.2	0.4	0
1973	2.0	40.8	34.7	18.4	2.0	2.0	0	0
1974	0.9	36	36.6	12.0	11.7	2.6	0.3	0
1975	0.4	17.3	47.6	24.4	6.2	4.0	0	0
1976	0.7	42.6	30.6	14.6	10.9	0.4	0.4	0
1977	-	-	-	-	-	-	-	-
1978	2.7	31.9	43.0	13.6	6.0	2.0	0.9	0
1979	4.2	39.9	40.6	11.3	2.8	1.1	0.1	0
1980	5.9	36.3	32.9	16.3	7.9	0.7	0.1	0
1981	3.5	31.6	37.5	19.0	6.6	1.6	0.2	0
1982	1.4	37.7	38.3	15.9	5.8	0.7	0	0.2
1983	3.1	47.0	32.6	12.7	3.7	0.8	0.1	0
1984	4.8	51.7	28.9	9.0	4.6	0.9	0.2	0
1985	5.1	41.0	35.7	12.1	4.9	1.1	0.1	0
1986	2.0	39.9	33.4	20.0	4.0	0.7	0	0
1987	3.9	41.4	31.8	16.7	5.8	0.4	0	0
1988	5.2	31.3	30.8	20.9	10.7	1.0	0.1	0
1989	7.9	39.0	30.1	15.9	5.9	1.3	0	0
1990	8.8	45.3	30.7	12.1	2.4	0.5	0.1	0
1991	5.2	33.6	43.5	12.8	3.9	0.8	0.3	0
1992	6.7	36.7	34.1	19.1	3.2	0.3	0	0
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	2.4	19.0	45.4	22.6	8.8	1.8	0.1	0
1996	1.7	18.7	46.0	23.8	8.8	0.8	0.1	0
1997	1.3	16.4	48.4	17.6	15.1	1.3	0	0
1998	4.0	35.1	37.0	16.5	6.1	1.1	0.1	0

Year	1	2	3	4	5	6	7	8
1999	2.7	23.5	50.6	20.3	2.9	0.0	0	0
2000	3.2	26.6	38.6	23.4	7.6	0.6	0	0
2001	1.9	15.2	39.4	32.0	10.8	0.7	0	0
2002	1.5	27.4	46.5	14.2	9.5	0.9	0	0
2003	2.6	28.8	38.9	21.0	7.6	1.1	0	0
2004	1.9	19.1	51.9	22.9	3.7	0.5	0	0
2005	2.7	21.4	36.3	30.5	8.5	0.5	0	0
2006	0.6	13.9	44.6	27.6	12.3	1.0	0	0
2007	1.6	27.7	34.5	26.2	9.2	0.9	0	0
2008	0.9	25.1	51.9	16.8	4.7	0.6	0	0
2009	2.6	30.7	47.3	15.4	3.7	0.4	0	0
2010	1.6	21.7	47.9	21.7	6.3	0.8	0	0
2011	1.0	35.9	45.9	14.4	2.8	0	0	0
2012	0.3	29.8	39.4	23.3	6.5	0.7	0	0
2013	0.1	32.6	37.3	20.8	8.6	0.6	0	0
2014	0.4	26.0	44.5	21.9	6.9	0.4	0	0
2015	0.1	31.6	40.6	21.6	6.0	0.2	0	0
2016	0.1	21.3	43.3	26.8	7.3	1.1	0	0
2017	0.3	31.0	41.6	19.6	7.2	0.3	0	0
2018	0.5	29.8	38.4	24.1	6.5	0.7	0	0
2019	0.6	26.9	32.5	25.4	13.7	0.8	0.0	0.0
Previous 10-yr mean	0.7	29.0	42.6	21.0	6.2	0.5	0.0	0.0
Overall Mean	2.3	31.1	39.6	18.9	6.9	1.0	0.1	0.0

Table 5.2.1.3. River age distribution (%) and mean river age for all European origin salmon caught in West Greenland 1968 to the present, excluding 1977, 1993 and 1994.

Year	1	2	3	4	5	6	7	8
1968	21.6	60.3	15.2	2.7	0.3	0	0	0
1969	0	83.8	16.2	0	0	0	0	0
1970	0	90.4	9.6	0	0	0	0	0
1971	9.3	66.5	19.9	3.1	1.2	0	0	0
1972	11.0	71.2	16.7	1.0	0.1	0	0	0
1973	26.0	58.0	14.0	2.0	0	0	0	0
1974	22.9	68.2	8.5	0.4	0	0	0	0
1975	26.0	53.4	18.2	2.5	0	0	0	0
1976	23.5	67.2	8.4	0.6	0.3	0	0	0
1977	-	-	-	-	-	-	-	-
1978	26.2	65.4	8.2	0.2	0	0	0	0
1979	23.6	64.8	11.0	0.6	0	0	0	0
1980	25.8	56.9	14.7	2.5	0.2	0	0	0
1981	15.4	67.3	15.7	1.6	0	0	0	0
1982	15.6	56.1	23.5	4.2	0.7	0	0	0
1983	34.7	50.2	12.3	2.4	0.3	0.1	0.1	0
1984	22.7	56.9	15.2	4.2	0.9	0.2	0	0
1985	20.2	61.6	14.9	2.7	0.6	0	0	0
1986	19.5	62.5	15.1	2.7	0.2	0	0	0
1987	19.2	62.5	14.8	3.3	0.3	0	0	0
1988	18.4	61.6	17.3	2.3	0.5	0	0	0
1989	18.0	61.7	17.4	2.7	0.3	0	0	0
1990	15.9	56.3	23.0	4.4	0.2	0.2	0	0
1991	20.9	47.4	26.3	4.2	1.2	0	0	0
1992	11.8	38.2	42.8	6.5	0.6	0	0	0
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	14.8	67.3	17.2	0.6	0	0	0	0
1996	15.8	71.1	12.2	0.9	0	0	0	0
1997	4.1	58.1	37.8	0.0	0	0	0	0
1998	28.6	60.0	7.6	2.9	0.0	1.0	0	0

Year	1	2	3	4	5	6	7	8
1999	27.7	65.1	7.2	0	0	0	0	0
2000	36.5	46.7	13.1	2.9	0.7	0	0	0
2001	16.0	51.2	27.3	4.9	0.7	0	0	0
2002	9.4	62.9	20.1	7.6	0	0	0	0
2003	16.2	58.0	22.1	3.0	0.8	0	0	0
2004	18.3	57.7	20.5	3.2	0.2	0	0	0
2005	19.2	60.5	15.0	5.4	0	0	0	0
2006	17.7	54.0	23.6	3.7	0.9	0	0	0
2007	7.0	48.5	33.0	10.5	1.0	0	0	0
2008	7.0	72.8	19.3	0.8	0.0	0	0	0
2009	14.3	59.5	23.8	2.4	0.0	0	0	0
2010	11.3	57.1	27.3	3.4	0.8	0	0	0
2011	19.0	51.7	27.6	1.7	0	0	0	0
2012	9.3	63.0	24.0	3.7	0	0	0	0
2013	4.5	68.2	24.4	2.5	0	0	0	0
2014	4.5	60.7	30.8	4.0	0	0	0	0
2015	9.2	54.9	28.8	5.8	1.2	0	0	0
2016	2.5	63.3	29.6	4.3	0.3	0	0	0
2017	10.0	73.0	15.4	1.7	0	0	0	0
2018	13.7	62.1	19.0	5.2	0	0	0	0
2019	7.5	60.5	24.2	7.5	0.4	0.0	0.0	0.0
Previous 10-yr mean	9.8	61.4	25.1	3.5	0.2	0.0	0.0	0.0
Overall Mean	16.2	61.1	19.4	3.0	0.3	0.0	0.0	0.0

Table 5.2.1.4. Sea age composition (%) of samples from fishery landings in West Greenland by continent of origin from 1985 to present, excluding 1977, 1993 and 1994.

Year	North American			European		
	1SW	2SW	Previous Spawners	1SW	2SW	Previous Spawners
1985	92.5	7.2	0.3	95.0	4.7	0.4
1986	95.1	3.9	1.0	97.5	1.9	0.6
1987	96.3	2.3	1.4	98.0	1.7	0.3
1988	96.7	2.0	1.2	98.1	1.3	0.5
1989	92.3	5.2	2.4	95.5	3.8	0.6
1990	95.7	3.4	0.9	96.3	3.0	0.7
1991	95.6	4.1	0.4	93.4	6.5	0.2
1992	91.9	8.0	0.1	97.5	2.1	0.4
1993	-	-	-	-	-	-
1994	-	-	-	-	-	-
1995	96.8	1.5	1.7	97.3	2.2	0.5
1996	94.1	3.8	2.1	96.1	2.7	1.2
1997	98.2	0.6	1.2	99.3	0.4	0.4
1998	96.8	0.5	2.7	99.4	0.0	0.6
1999	96.8	1.2	2.0	100.0	0.0	0.0
2000	97.4	0.0	2.6	100.0	0.0	0.0
2001	98.2	2.6	0.5	97.8	2.0	0.3
2002	97.3	0.9	1.8	100.0	0.0	0.0
2003	96.7	1.0	2.3	98.9	1.1	0.0
2004	97.0	0.5	2.5	97.0	2.8	0.2
2005	92.4	1.2	6.4	96.7	1.1	2.2
2006	93.0	0.8	5.6	98.8	0.0	1.2
2007	96.5	1.0	2.5	95.6	2.5	1.5
2008	97.4	0.5	2.2	98.8	0.8	0.4

Year	North American			European		
	1SW	2SW	Previous Spawn-ers	1SW	2SW	Previous Spawners
2009	93.4	2.8	3.8	89.4	7.6	3.0
2010	98.2	0.4	1.4	97.5	1.7	0.8
2011	93.8	1.5	4.7	82.8	12.1	5.2
2012	93.2	0.7	6.0	98.0	1.6	0.4
2013	94.9	1.4	3.7	96.6	2.4	1.0
2014	91.3	1.1	7.6	96.1	2.4	1.5
2015	97.0	0.7	2.3	98.2	1.2	0.6
2016	93.5	2.5	4.0	95.5	3.5	1.0
2017	92.5	1.5	6.0	93.1	5.7	1.2
2018	97.4	0.4	2.2	97.4	2.6	0.0
2019	95.9	1.4	2.7	97.9	1.7	0.3
Previous 10-yr mean	94.5	1.3	4.2	94.5	4.1	1.5
Overall Mean	95.3	2.0	2.7	96.7	2.5	0.8

Table 5.2.2.1. The number of samples and continent of origin of Atlantic salmon by NAFO Division sampled in West Greenland in 2019.

NAFO Division	Sample dates	Numbers			Percentages	
		North American	European	Total	North American	European
1B	Aug 26–Sep 24	314	51	365	86.0	14.0
1C	Sep 09–Sep 17	249	174	423	58.9	41.1
1D	Sep 10 and Sep 20	17	19	36	47.2	52.8
1F	Aug 16–Sep 13	186	61	247	75.3	24.7
TOTAL		766	305	1071	71.5	28.5

Table 5.2.2.2. SNP baseline reporting groups and codes used for continent and region of origin assignments in 2019. See Figure 5.2.2.3 for location details.

ICES region	Reporting group	Group acronym	ICES region	Reporting group	Group acronym
Quebec (North)	Ungava	UNG	Europe	Spain	SPN
Labrador	Labrador Central	LAC		France	FRN
	Lake Melville	MEL		European Broodstock	EUB
	Labrador South	LAS		United Kingdom / Ireland	BRI
Quebec	St Lawrence North Shore Lower	QLS		Barents-White Seas	BAR
	Anticosti	ANT		Baltic Sea	BAL
	Gaspe Peninsula	GAS		Southern Norway	SNO
	Quebec City Region	QUE		Northern Norway	NNO
Gulf	Gulf of St Lawrence	GUL		Iceland	ICE
Scotia-Fundy	Inner Bay of Fundy	IBF		Greenland	GL
	Eastern Nova Scotia	ENS			
	Western Nova Scotia	WNS			
	Saint John River & Aquaculture	SJR			
Newfoundland	Northern Newfoundland	NNF			
	Western Newfoundland	WNF			
	Newfoundland 1	NF1			
	Newfoundland 2	NF2			
	Fortune Bay	FTB			
	Burin Peninsula	BPN			
	Avalon Peninsula	AVA			
USA	Maine, United States	USA			

Table 5.2.2.3. The estimated percentage and numbers of North American (NA) and European (E) Atlantic salmon caught in West Greenland fishery based on NAFO Division continent of origin estimates weighted by catch weight (1982 to the present, excluding 1993 and 1994). Numbers are rounded to the nearest hundred fish. Unreported catch is not included in this assessment.

	Percentage by continent weighted by catch		Numbers of salmon by continent	
Year	NA	E	NA	E
1982	57	43	192 200	143 800
1983	40	60	39 500	60 500
1984	54	46	48 800	41 200
1985	47	53	143 500	161 500
1986	59	41	188 300	131 900
1987	59	41	171 900	126 400
1988	43	57	125 500	168 800
1989	55	45	65 000	52 700
1990	74	26	62 400	21 700
1991	63	37	111 700	65 400
1992	45	55	46 900	38 500
1995	67	33	21 400	10 700
1996	70	30	22 400	9700
1997	85	15	18 000	3300
1998	79	21	3100	900
1999	91	9	5700	600
2000	65	35	5100	2700
2001	67	33	9400	4700
2002	69	31	2300	1000
2003	64	36	2600	1400
2004	72	28	3900	1500
2005	74	26	3500	1200
2006	69	31	4000	1800
2007	76	24	6100	1900

	Percentage by continent weighted by catch		Numbers of salmon by continent	
2008	86	14	8000	1300
2009	89	11	7000	800
2010	80	20	10 000	2600
2011	93	7	6800	600
2012	79	21	7800	2100
2013	82	18	11 500	2700
2014	72	28	12 800	5400
2015	79	21	13 500	3900
2016	64	36	5100	3300
2017	74	26	6100	2200
2018	80	20	10 600	2600
2019	72	28	6800	2600

Table 5.2.2.4 Bayesian estimates of mixture composition for West Greenland Atlantic Salmon fishery by region and overall for 2019. Baseline locations refer to regional reporting groups identified in Table 5.2.2.2 and Figure 5.2.2.2. Sample locations are identified by NAFO Divisions. Mean estimates provided with 95% credible interval in parentheses. Estimates of mixture contributions not supported by significant individual assignments (P>0.8) are represented as zero.

Reporting Group	ROO	NAFO 1B	NAFO 1C	NAFO 1D	NAFO 1F	Overall
Baltic Sea	EUR	0	0	0	0	0
Barents-White Seas	EUR	0	0	0	0	0
European Broodstock	EUR	0	0	0	0	0
France	EUR	0	0.2 (0.0, 0.9)	0	0	0.1 (0.0, 0.3)
Greenland	EUR	0	0	0	0	0
Iceland	EUR	0	0	0	0	0
Northern Norway	EUR	0	0	0	0	0
Southern Norway	EUR	0	0	0	0	0
Spain	EUR	0.5 (0.0, 1.6)	0	0	0.4 (0.0, 1.5)	0.2 (0.0, 0.6)
United Kingdom/Ireland	EUR	13.5 (10.2, 17.2)	40.7 (36.1, 45.4)	51.7 (35.8, 67.3)	24.0 (18.9, 29.5)	28.2 (25.6, 31.0)
Anticosti	NA	0	1.5 (0.5, 2.9)	0.0 (0.0, 0.0)	1.6 (0.4, 3.7)	0.9 (0.4, 1.7)
Avalon Peninsula	NA	0	0	0	0	0
Burin Peninsula	NA	0	0	0	0	0
Eastern Nova Scotia	NA	0	0	0	0.9 (0.1, 2.5)	0.4 (0.1, 0.9)
Fortune Bay	NA	0	0	0	0	0
Gaspe Peninsula	NA	20.1 (15.7, 24.7)	15.3 (11.8, 19.2)	24.8 (12.2, 40.1)	20.8 (15.4, 26.7)	18.6 (16.1, 21.2)
Gulf of St Lawrence	NA	19.2 (14.9, 23.8)	12.1 (8.9, 15.6)	2.8 (0.0, 10.8)	14.3 (9.8, 19.3)	14.2 (12.0, 16.6)
Inner Bay of Fundy	NA	0	0	0	0	0
Labrador Central	NA	7.0 (3.8, 10.9)	5.0 (2.8, 7.6)	7.3 (0.3, 18.1)	3.3 (1.3, 6.2)	5.4 (3.9, 7.2)
Labrador South	NA	19.1 (14.6, 23.9)	11.8 (8.6, 15.3)	0	12.6 (8.7, 17.2)	13.5 (11.4, 15.8)
Lake Melville	NA	1.6 (0.3, 3.7)	1.5 (0.5, 3.1)	0	0	1.5 (0.8, 2.6)
Maine, United States	NA	1.7 (0.6, 3.4)	1.4 (0.5, 2.8)	0	3.2 (1.4, 5.8)	1.9 (1.2, 2.9)
Newfoundland 1	NA	0.6 (0.1, 1.6)	0	0	2.1 (0.5, 4.3)	0.7 (0.2, 1.4)
Newfoundland 2	NA	0.8 (0.1, 2.1)	0	0	0.9 (0.1, 2.5)	0.9 (0.4, 1.6)
Northern Newfoundland	NA	0	0	0	0.4 (0.0, 1.5)	0.1 (0.0, 0.4)
Quebec City Region	NA	2.6 (0.7, 5.0)	1.9 (0.7, 3.7)	0	3.5 (1.1, 6.8)	2.3 (1.3, 3.7)
St. John River & AQ	NA	0	0	0	0	0
St. Lawrence N. Shore Lower	NA	4.4 (2.4, 7.0)	2.3 (1.0, 4.1)	7.8 (1.2, 18.8)	2.9 (1.1, 5.5)	3.7 (2.6, 5.0)
Ungava	NA	6.6 (4.3, 9.4)	2.1 (1.0, 3.7)	0	6.1 (3.4, 9.4)	4.6 (3.4, 5.9)
Western Newfoundland	NA	2.2 (0.9, 4.1)	3.0 (1.5, 5.1)	0	2.3 (0.7, 4.6)	2.3 (1.4, 3.4)
Western Nova Scotia	NA	0	0	0	0	0

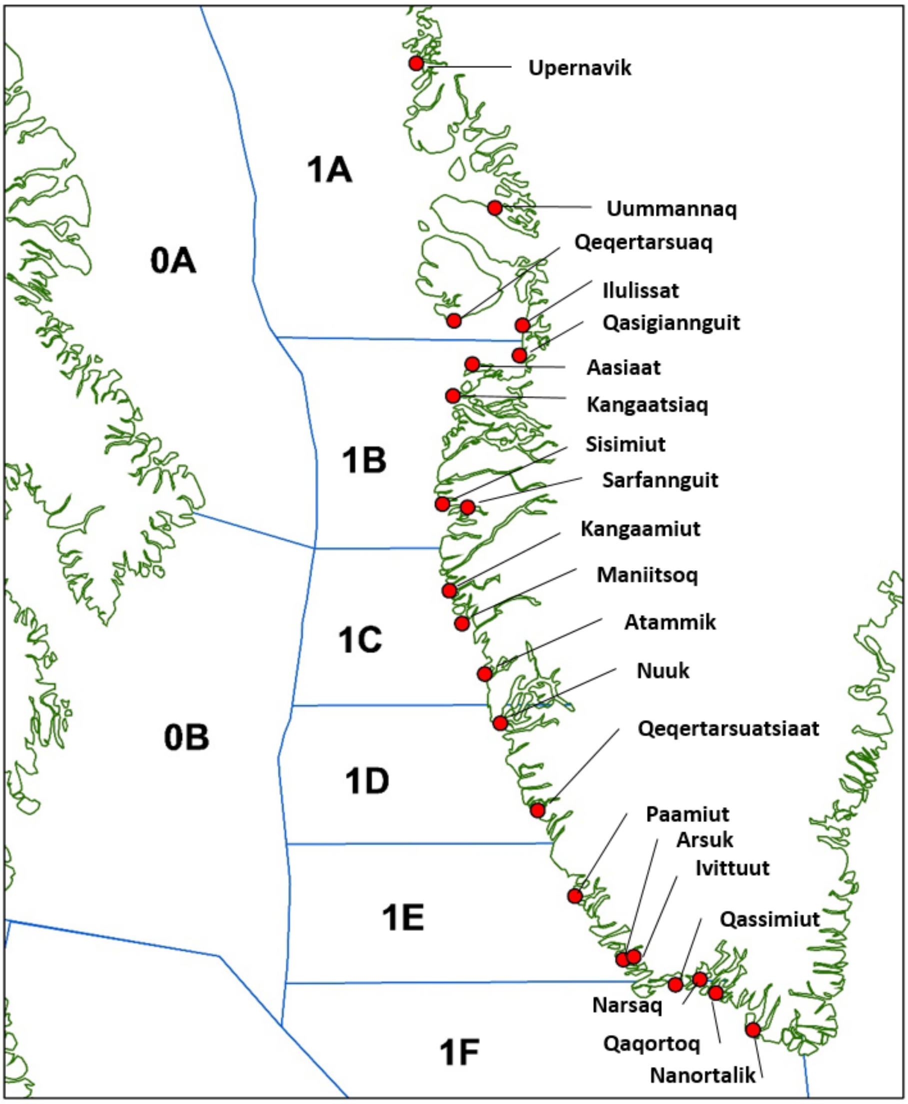


Figure 5.1.1.1. Map of southwest Greenland showing communities to which Atlantic salmon have historically been landed and corresponding NAFO divisions. In 2019 samples were obtained from Sisimiut (NAFO Division 1B), Maniitsoq (1C), Nuuk (1D) and Qaqortoq (1F).

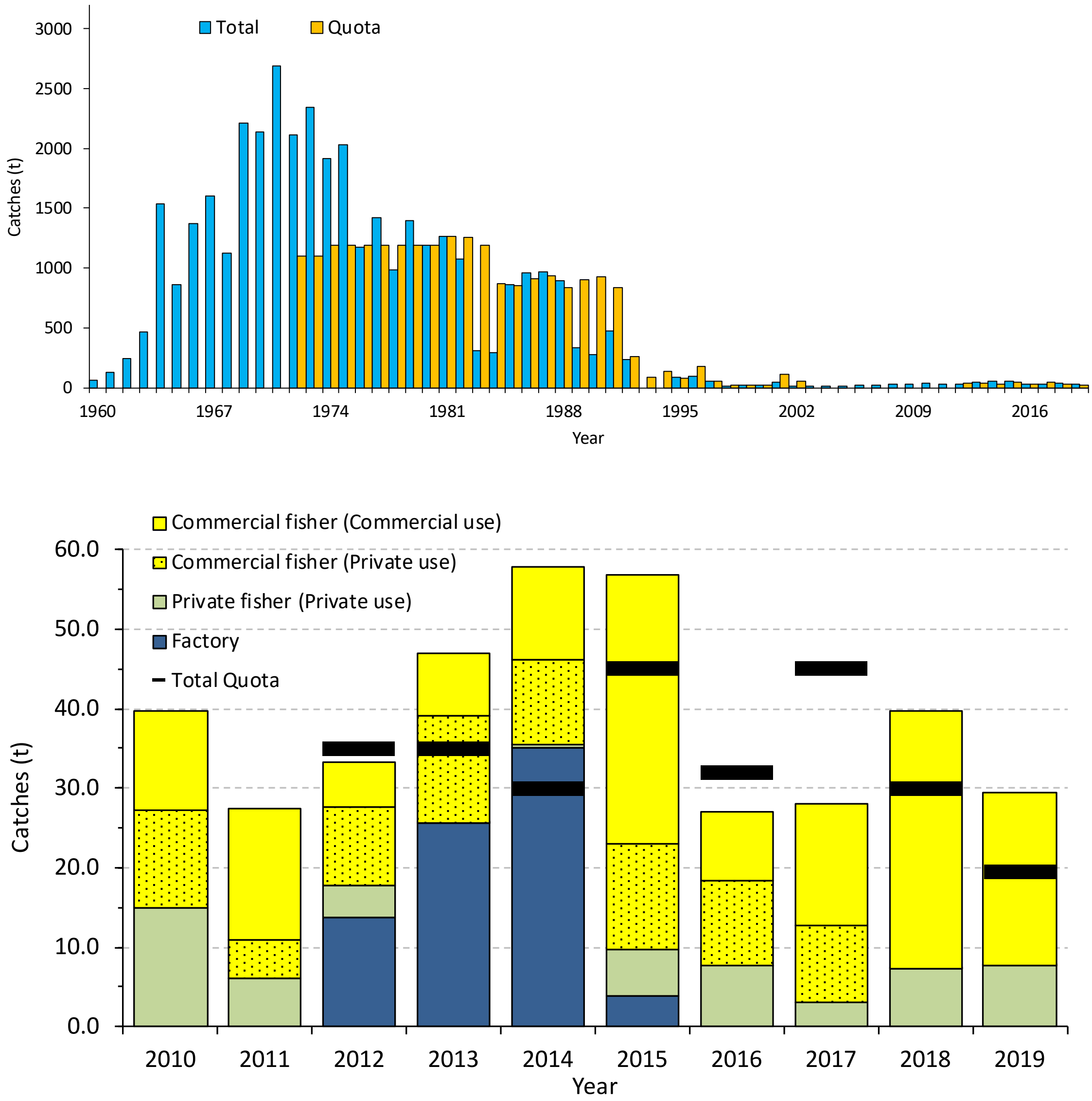


Figure 5.1.1.2. Nominal catches and commercial quotas (t, round fresh weight) of salmon at West Greenland for 1960–2019 (top panel) and 2010–2019 (bottom panel). Total reported landings from 2010–2019 are displayed by landings type. No quotas were set from 2002–2011, a factory only quota was set from 2012–2014, and a single quota of 45 t for all components of the fishery was applied in 2015, reduced to 32 t in 2016 to account for overharvest in 20178 and set to 45 t in 2017. In 2018, a quota of 30 t was set for all components of the fishery and the 2019 quota was set to 19.5 t to account for overharvest in 2018. All fishers are required to have a licence to fish for Atlantic salmon starting in 2018.

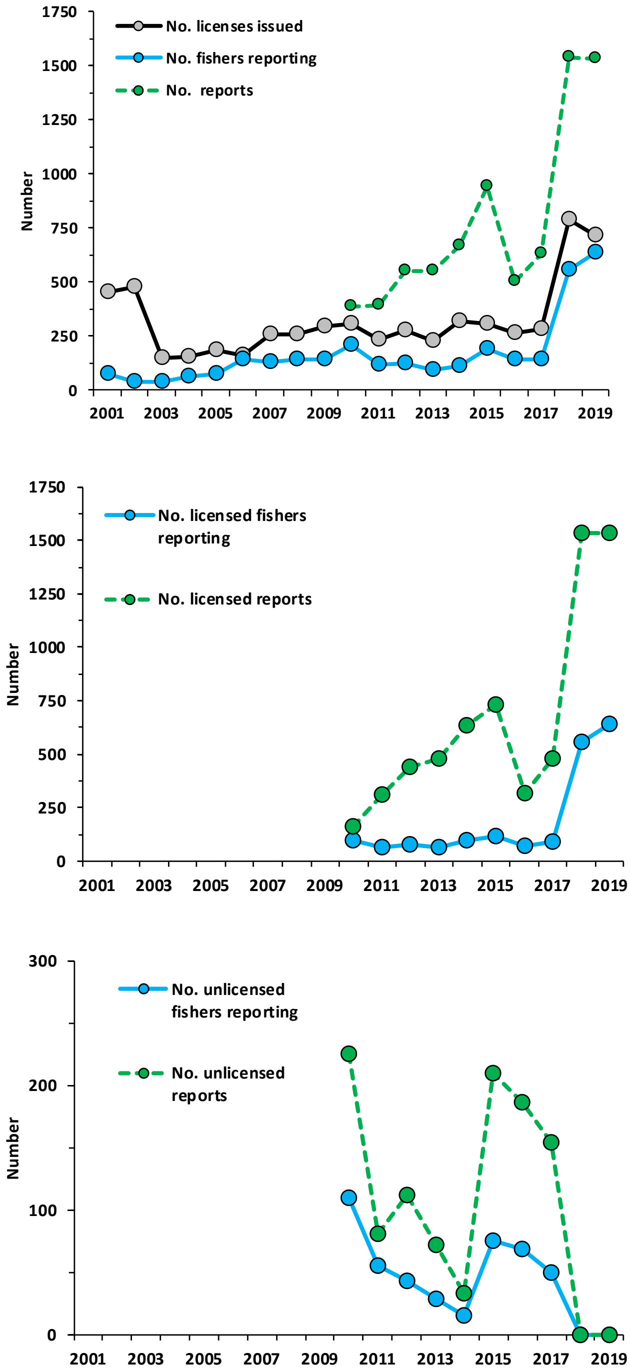
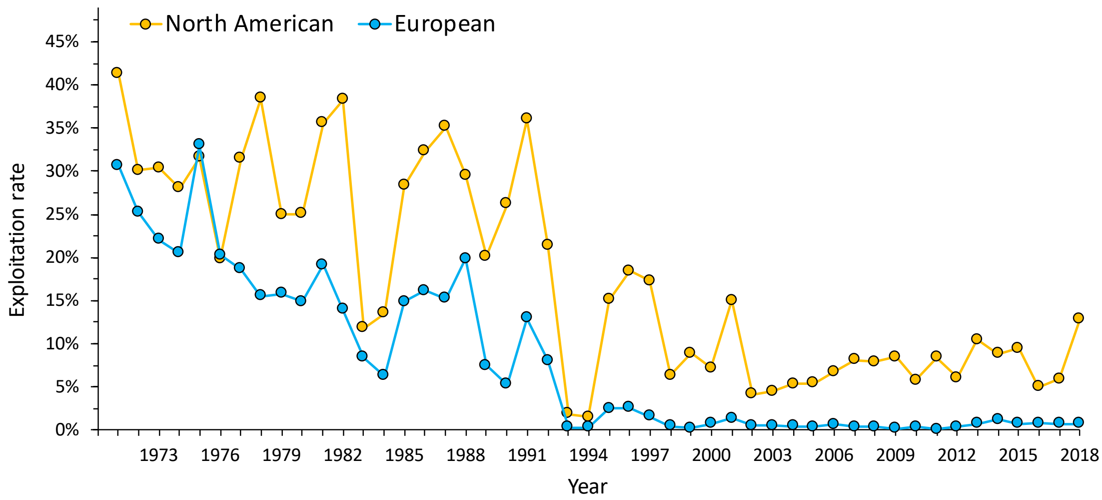


Figure 5.1.1.3. Number of licences issued, total number of fishers reporting landings, and the total number of reports received (2001–2019; top). The number of fishers reporting and the number of reports received for licensed (middle) and unlicensed (bottom) fishers are also provided. Data describing licensed and unlicensed fisher landings reports are only available since 2010, and all fishers were required to have a licence starting in 2018.



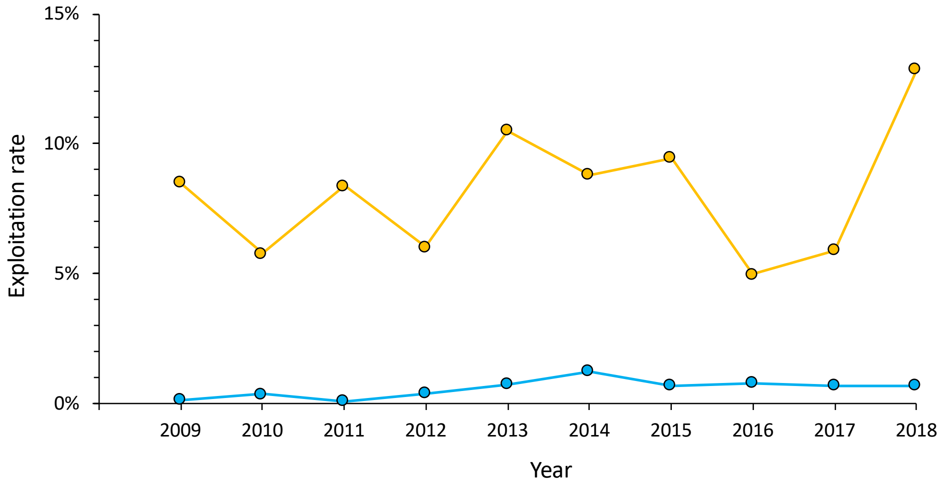


Figure 5.1.3.1. Exploitation rate (%) for NAC 1SW non-maturing and Southern NEAC non-maturing Atlantic salmon at West Greenland, 1971–2018 (top) and 2009–2018 (bottom). Exploitation rate estimates are only available to 2018, as 2019 exploitation rates are dependent on 2020 returns. Unreported catch is included.

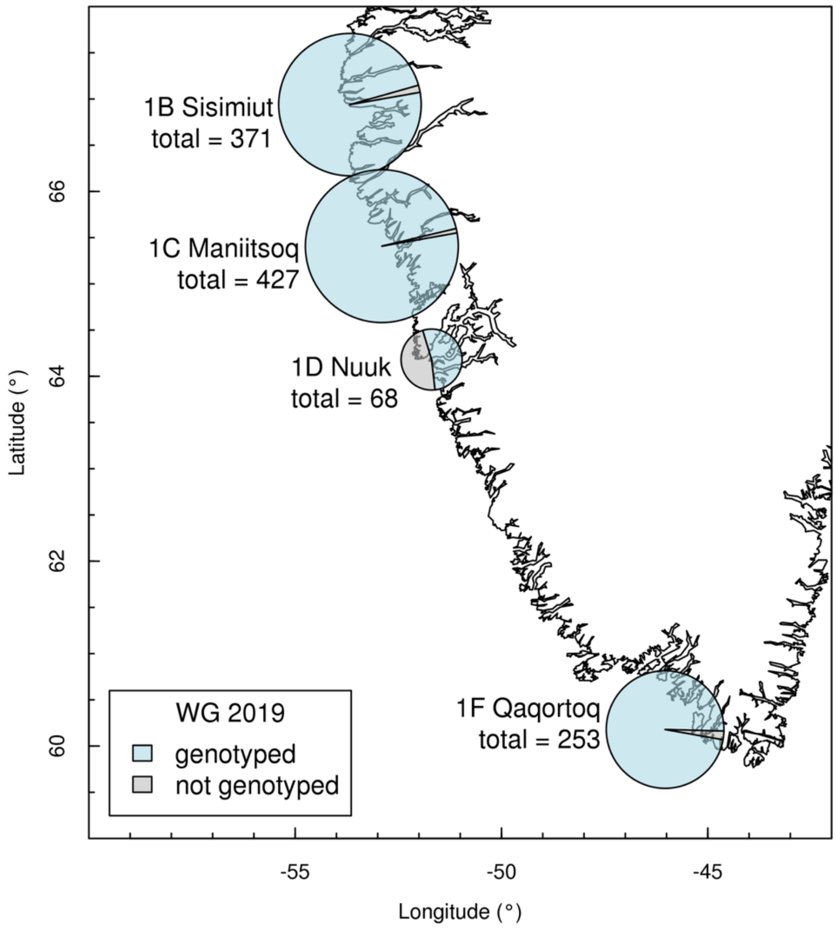
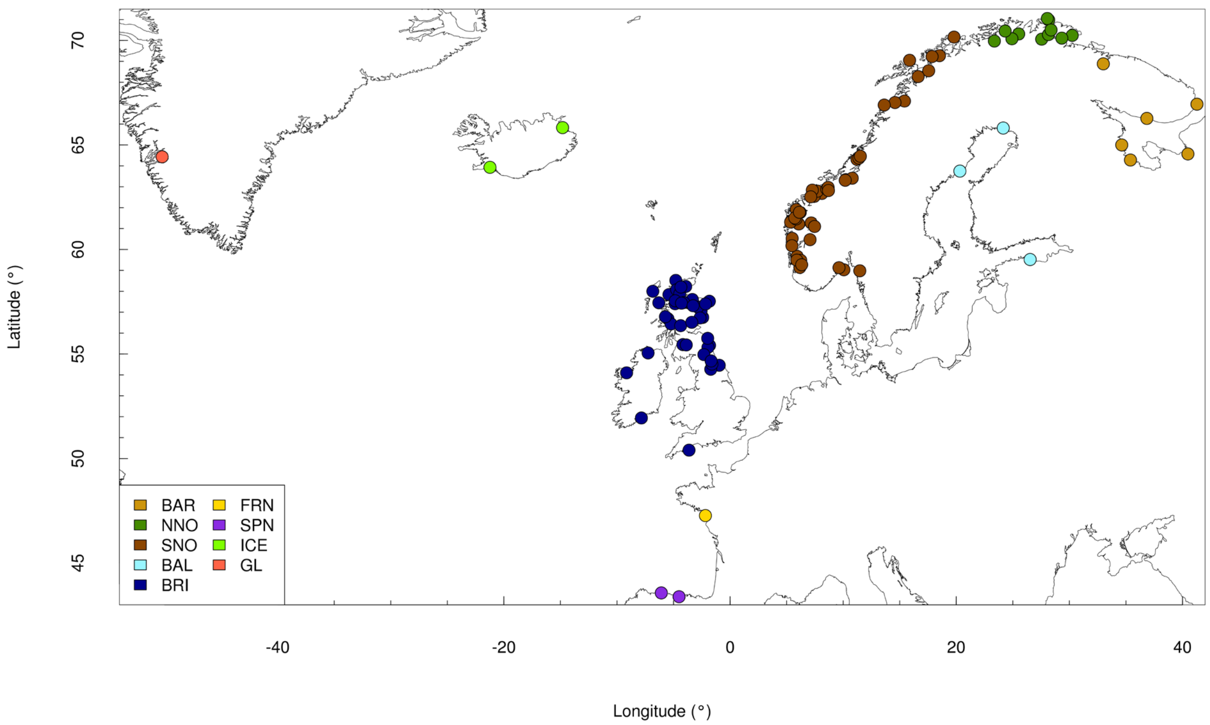


Figure 5.2.2.1. Map showing total samples and subsamples for West Greenland Atlantic Salmon fishery 2019 SNP-based analyses to estimate continent and region of origin. Pie charts are scales to sample size and blue and grey areas represent the proportions genotyped and not genotyped.


Latitude (°)
Longitude (°)
BAR
NNO
SNO
BAL
BRI
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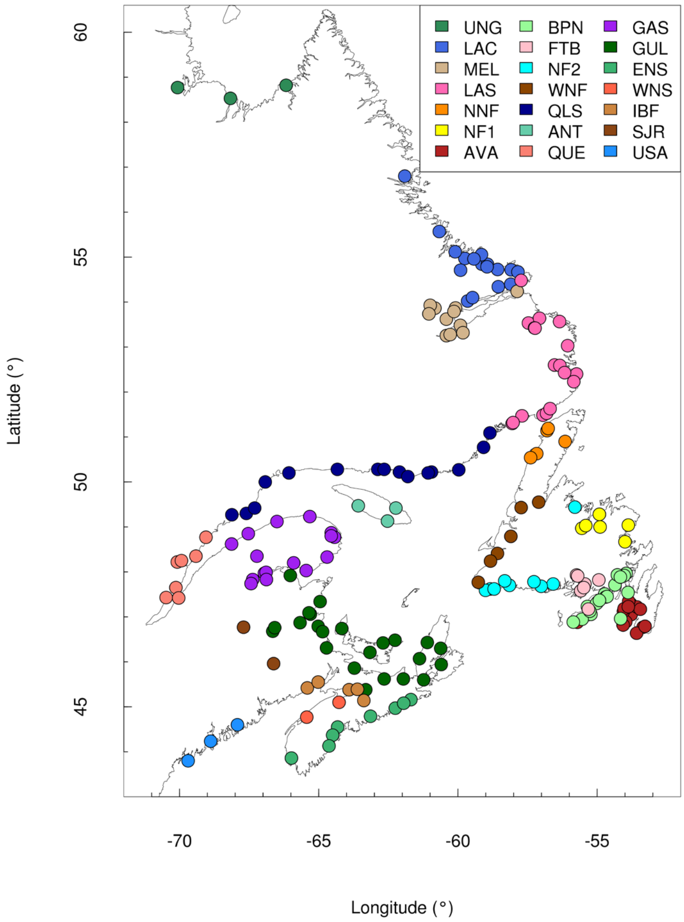


Figure 5.2.2.2. Map of sample locations for the SNP-based genetic baseline for European (top) and North American (bottom) reporting groups. The EUB (European Broodstock) reporting group does not have a geographic location and is therefore not represented on the top map. See Table 5.2.2.2 for location abbreviations.

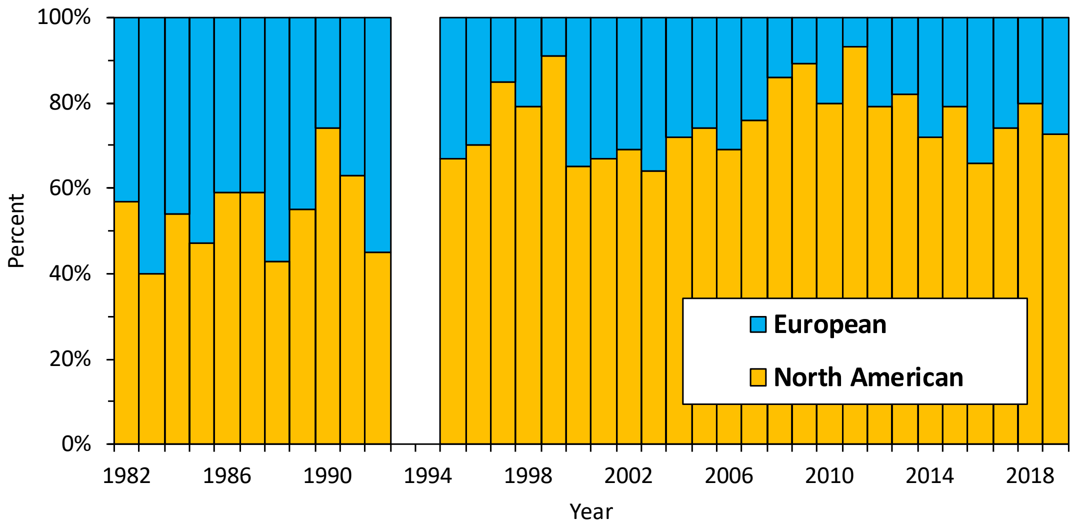


Figure 5.2.2.3. Percent of the sampled catch by continent of origin for 1982 to the present.

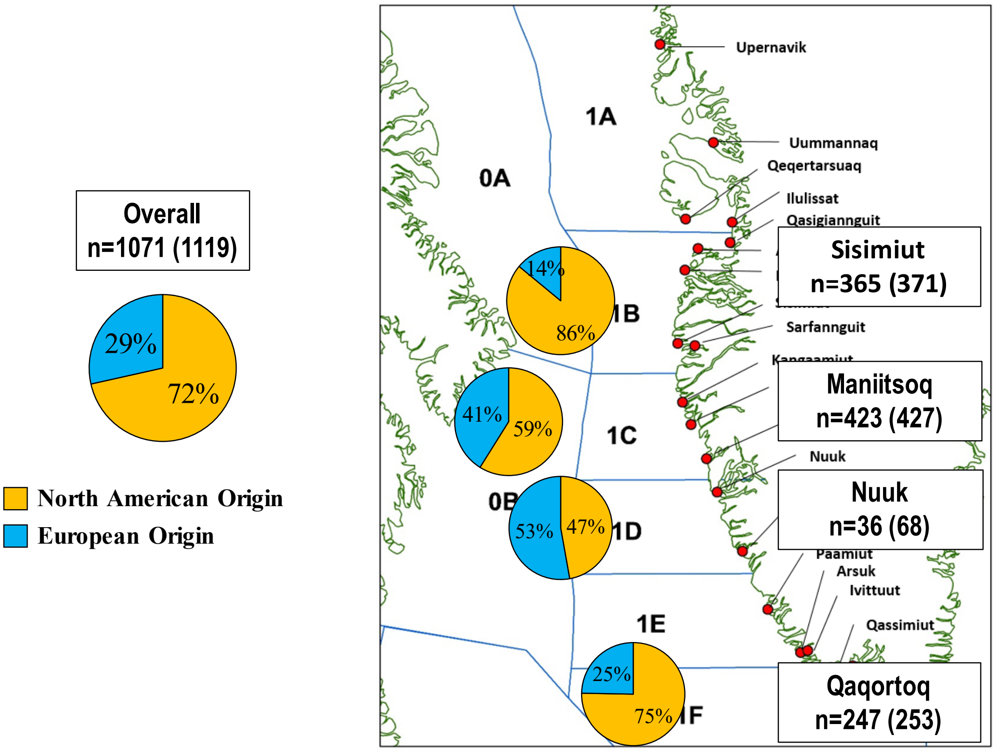


Figure 5.2.2.4. Percentage of North American and European origin Atlantic salmon sampled from the 2019 Greenland fishery according to NAFO division and community sampled. Samples were collected from four NAFO divisions (1B (Sisimiut), 1C (Maniitsoq), 1D (Nuuk), and 1F (Qaqortoq)). Sample size is provided and the subsample genotyped and analysed is identified parenthetically.

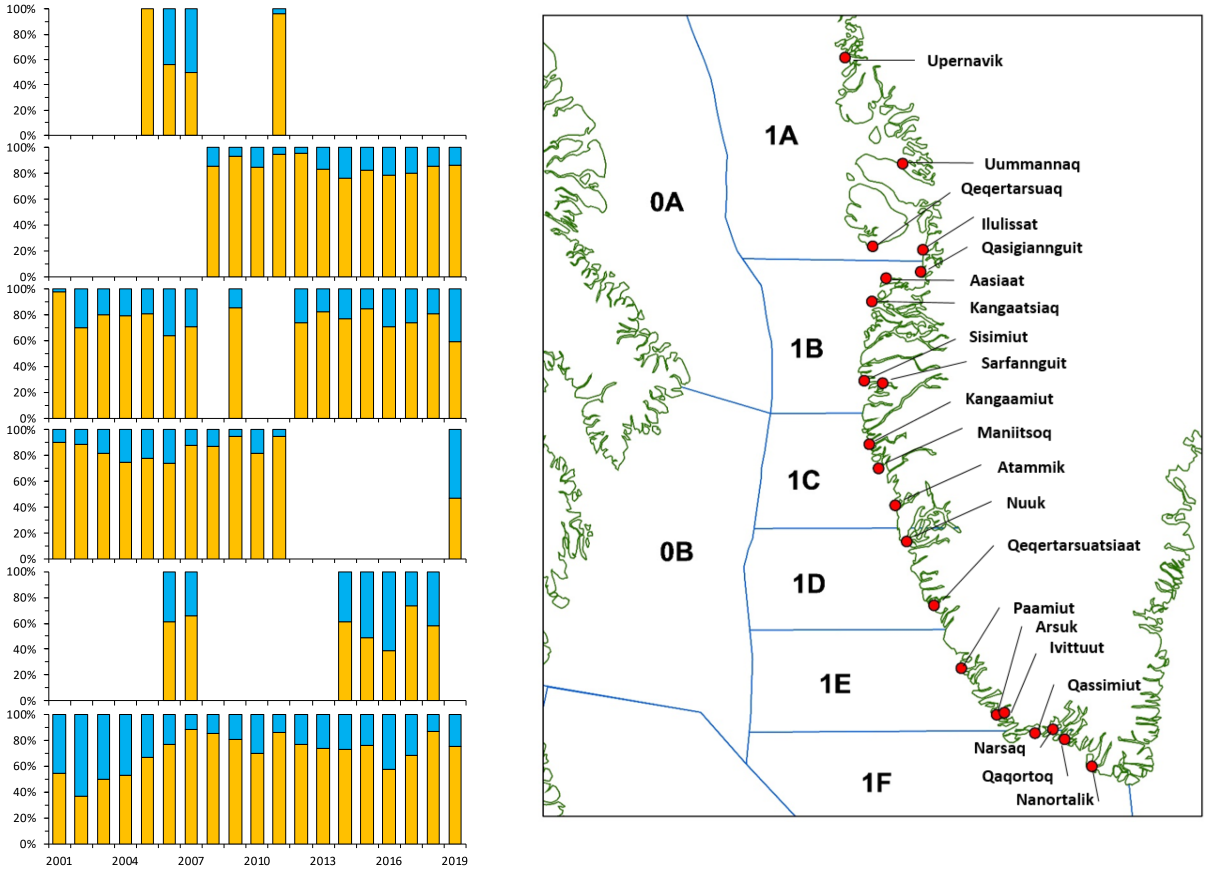
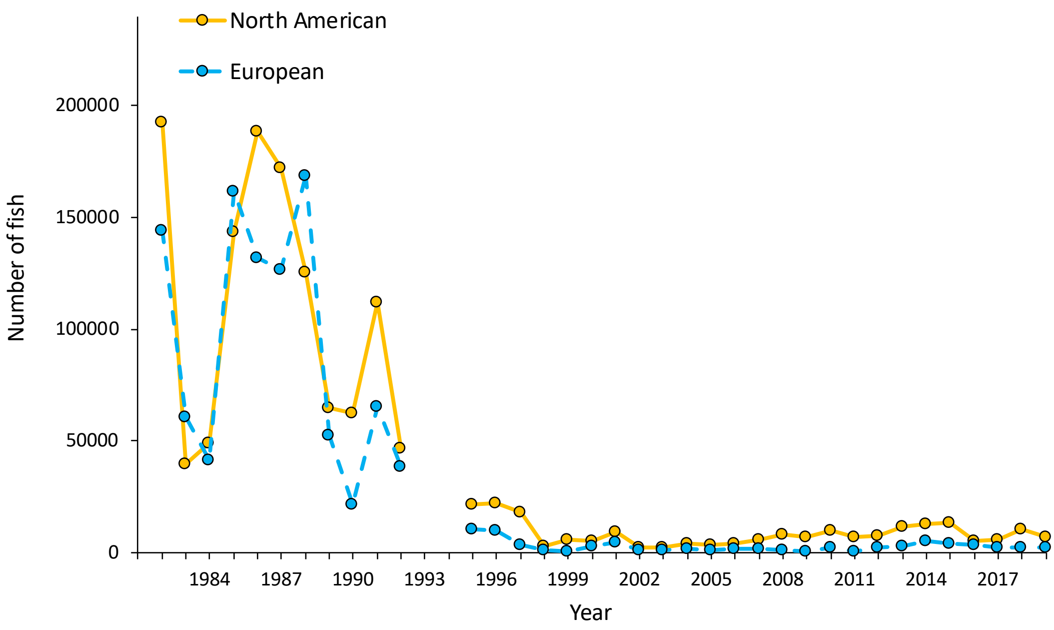


Figure 5.2.2.5. Percentage of North American (orange) and European (blue) origin Atlantic salmon sampled from Greenland fisheries by year (2001–2019) and NAFO Division. The northernmost relevant NAFO Division (1A) is the top graph and southernmost (1F) is the bottom graph. Where data are presented, samples were collected during that year and within that NAFO Division. The Division 1A 2005 value is from a single sample.



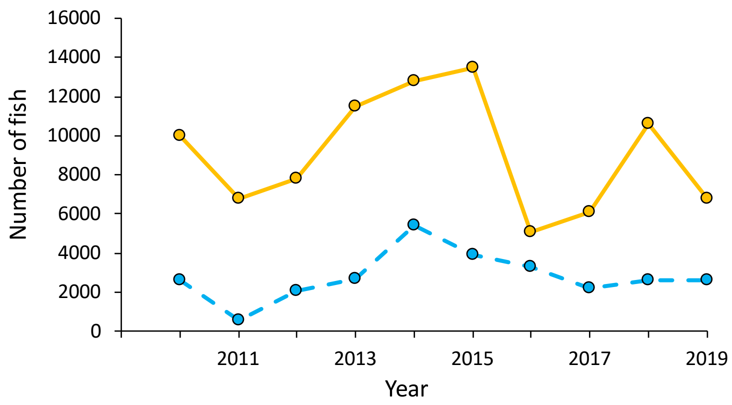


Figure 5.2.2.6. Number of North American and European Atlantic salmon caught at West Greenland from 1982–2019 (top) and 2010–2019 (bottom). Estimates are based on continent of origin by NAFO division, weighted by catch (weight) in each division. Numbers are rounded to the nearest hundred fish. Unreported catch not included.

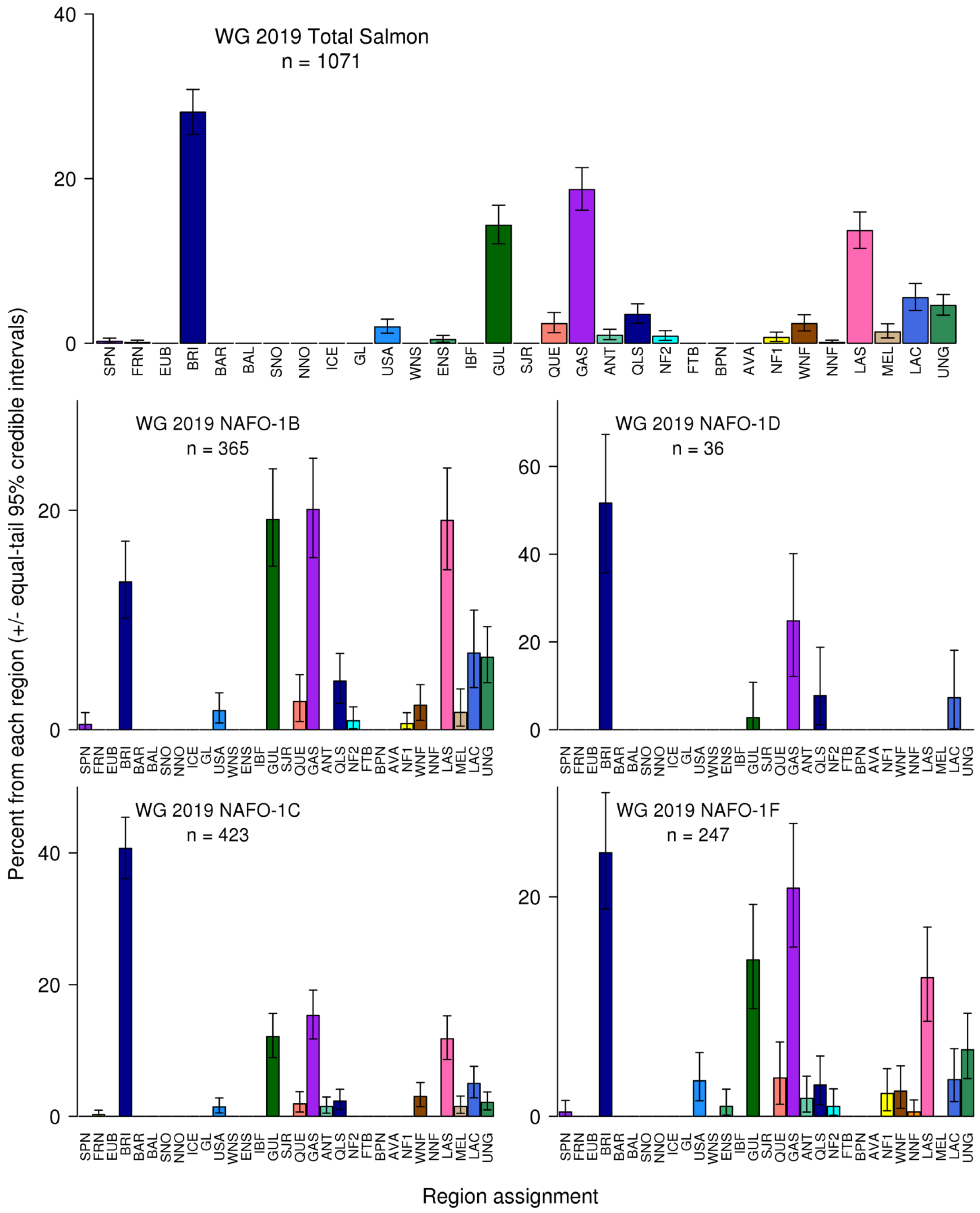


Figure 5.2.2.7. Bayesian estimates of mixture composition of samples from the West Greenland Atlantic salmon fishery for 2019 by region and overall using the SNP baseline. Baseline locations refer to genetic reporting groups identified in Table 5.2.2.2 and Figure 5.2.2.2. See Table 5.2.3.1 for detailed results. Estimates of mixture contributions not supported by significant individual assignments (P>0.8) are represented as zero.

Figure 5.3.1. Summary 2SW (NAC regions) and MSW (Southern NEAC) 2019 median (from the Monte Carlo posterior distributions) spawner estimates in relation to Conservation Limits/Management Objectives (CL/MO). The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the spawner estimate is above the CL), At Risk (at risk of suffering reduced reproductive capacity: median spawner estimate is above the CL, but the 5th percentile is below) and Suffering (suffering reduced reproductive capacity: median spawner estimate is below the CL).

Annex 1: List of Working Paper submitted to WGNAS 2020

WP No.	Authors	Title
01	Nygaard, R.	The salmon fishery in Greenland 2019
02	Sheehan, T. F., Coyne, J., Davies, G., Deschamps, D., Haas-Castro, R., Quinn, P., Vaughn, L., Nygaard, R., Bradbury, I. R., Robertson, M. J., Ó Maoiléidigh, N. and Carr, J.	The International Sampling Program: Continent of Origin and Biological Characteristics of Atlantic Salmon Collected at West Greenland in 2019
03	Bardarson, H., Gudbergsson, G., Jonsson, I.R., and Sturlaugsson, J.	National Report for Iceland: The 2019 Salmon Season
04	Prusov, S.	Atlantic Salmon Fisheries and Status of Stocks in Russia. National Report for 2019
05	Erkinaro, J., Orell, P., Falkegård, M., Kylmäaho, M., Johansen, N., Haantie, J., Pohjola, J.-P. & Kuusela, J.	Status of Atlantic salmon stocks in the rivers Teno/Tana and Näätämöjoki/Neidenelva, Finland/Norway
06	Fiske, P., Wennevik, V., Jensen, A.J., Utne, K.R., and Bolstad, G.	Atlantic salmon; National Report for Norway 2019
07	Jones, D., Ahlbeck Bergendahl, I., Degerman, E., Söderberg, L. & Sers, B.	Fisheries, Status and Management of Atlantic Salmon stocks in Sweden: National Report for 2019
08	Jepsen, N.	National report for Denmark -2019
09	Jacobsen, J.A.	Status of the fisheries for Atlantic salmon and production of farmed salmon in 2019 for the Faroe Islands
10	Millane, M., Maxwell, H., Ó Maoiléidigh, N., Gargan, P., Fitzgerald, C., O'Higgins, K., White, J., Dillane, M., McGrory, T., Bond, N., McLaughlin, D., Rogan, G., Cotter, D., , and Poole, R.	National Report for Ireland - The 2019 Salmon Season
11	Marine Scotland Science, Salmon and Freshwater Fisheries	National Report for UK (Scotland): 2019 season
12	Cefas, Environment Agency and Natural Resources Wales	Salmon stocks and fisheries in UK (England and Wales), 2019 - Preliminary assessment prepared for ICES, April 2020
13	Ensing, D., Kennedy, R., and Boylan, P.	Summary of Salmon Fisheries and Status of Stocks in Northern Ireland for 2019
14	Buoro, M.	National report France including Saint Pierre and Miquelon 2019
15	Freese, M.	National Report Germany 2019
16	de la Hoz, J.	Salmon Fisheries and Status of Stocks in Spain (Asturias-2019)

WP No.	Authors	Title
17	April, J. and Cauchon, V.	Status of Atlantic salmon Stocks in Québec in 2019
18	April, J. and Cauchon, V.	Smolt production, freshwater and sea survival on two index rivers in Québec, the Saint-Jean and the Trinité (2019)
19	Kelly, N.I., Robertson, M.J., Burke, C., Bradbury, I., Van Leeuwen, T., Dempson, J.B., Lehnert, S., Messmer, A., Duffy, S., Poole, R. and Loughlin, K.	Status of Newfoundland and Labrador Atlantic Salmon 2019
20	Biron, M., Chaput, G., Cairns, D., Dauphin, G., Douglas, S., and LeBlanc, S.	Atlantic Salmon (*Salmo Salar*) in DFO Gulf Region Salmon Fishing Areas 15 – 18 to 2019
21	Fisheries and Oceans Canada	Stock status update of Atlantic salmon in Salmon Fishing Areas (SFAs) 19-21 and 23, Canada
22	Atkinson, E., Sweka, J., Kocik, J., Gephard, S., Bruchs, C., and Sheehan, T.	National Report for the United States, 2019
23	Chaput, G., April, J., Biron, M., Cairns, D., Cauchon, V., Daigle, A., Douglas, S., Kelly, N., Poole, R., Raab, D., Reader, J. and Robertson, M.	Catch Statistics and Aquaculture Production Values for Canada: preliminary 2019, final 2018
24	Millane, M., Fiske, P., Samokhvalov, I. & Magnuson, S.	NASCO NEAC Framework of Indicators Working Group Report – 2020
25	Chaput, G, Kærgaard, K, Ó Maoiléidigh, N., and Kircheis, D.	NASCO NAC Framework of Indicators Working Group Report – 2020

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Annex 4: Reported nominal catch of salmon in numbers and weight

Reported nominal catch of salmon in numbers and weight (tonnes round fresh weight) by sea-age class. Catches reported for 2019 may be provisional. Methods used for estimating age composition given in footnote.

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Greenland	1982	315 532	-	17 810	-	-	-	-	-	-	-	-	-	2 688	-	336 030	1 077
	1983	90 500	-	8 100	-	-	-	-	-	-	-	-	-	1 400	-	100 000	310
	1984	78 942	-	10 442	-	-	-	-	-	-	-	-	-	630	-	90 014	297
	1985	292 181	-	18 378	-	-	-	-	-	-	-	-	-	934	-	311 493	864
	1986	307 800	-	9 700	-	-	-	-	-	-	-	-	-	2 600	-	320 100	960
	1987	297 128	-	6 287	-	-	-	-	-	-	-	-	-	2 898	-	306 313	966
	1988	281 356	-	4 602	-	-	-	-	-	-	-	-	-	2 296	-	288 254	893
	1989	110 359	-	5 379	-	-	-	-	-	-	-	-	-	1 875	-	117 613	337
	1990	97 271	-	3 346	-	-	-	-	-	-	-	-	-	860	-	101 477	274
	1991	167 551	415	8 809	53	-	-	-	-	-	-	-	-	743	4	177 103	472
	1992	82 354	217	2 822	18	-	-	-	-	-	-	-	-	364	2	85 540	237
	1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1995	31 241	-	558	-	-	-	-	-	-	-	-	-	478	-	32 277	83
	1996	30 613	-	884	-	-	-	-	-	-	-	-	-	568	-	32 065	92
	1997	20 980	-	134	-	-	-	-	-	-	-	-	-	124	-	21 238	58
	1998	3 901	-	17	-	-	-	-	-	-	-	-	-	88	-	4 006	11
	1999	6 124	18	50	0	-	-	-	-	-	-	-	-	84	1	6 258	19
	2000	7 715	21	0	0	-	-	-	-	-	-	-	-	140	0	7 855	21
	2001	14 795	40	324	2	-	-	-	-	-	-	-	-	293	1	15 412	43
	2002	3 344	10	34	0	-	-	-	-	-	-	-	-	27	0	3 405	10
	2003	3 933	12	38	0	-	-	-	-	-	-	-	-	73	0	4 044	12
	2004	4 488	14	51	0	-	-	-	-	-	-	-	-	88	0	4 627	15
	2005	3 120	13	40	0	-	-	-	-	-	-	-	-	180	1	3 340	14
	2006	5 746	20	183	1	-	-	-	-	-	-	-	-	224	1	6 153	22
	2007	6 037	24	82	0	6	0	-	-	-	-	-	-	144	1	6 263	25
	2008	9 311	26	47	0	0	0	-	-	-	-	-	-	177	1	9 535	26
	2009	7 442	27	268	1	0	0	-	-	-	-	-	-	328	1	8 038	29
	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11 579	40
	2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 088	28

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9 622	33
	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14 030	47
	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17 440	58
	2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16 855	57
	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 522	27
	2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 023	28
	2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12 864	40
	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
Canada	1982	358 000	716	-	-	-	-	-	-	-	-	240 000	1 082	-	-	598 000	1 798
	1983	265 000	513	-	-	-	-	-	-	-	-	201 000	911	-	-	466 000	1 424
	1984	234 000	467	-	-	-	-	-	-	-	-	143 000	645	-	-	377 000	1 112
	1985	333 084	593	-	-	-	-	-	-	-	-	122 621	540	-	-	455 705	1 133
	1986	417 269	780	-	-	-	-	-	-	-	-	162 305	779	-	-	579 574	1 559
	1987	435 799	833	-	-	-	-	-	-	-	-	203 731	951	-	-	639 530	1 784
	1988	372 178	677	-	-	-	-	-	-	-	-	137 637	633	-	-	509 815	1 310
	1989	304 620	549	-	-	-	-	-	-	-	-	135 484	590	-	-	440 104	1 139
	1990	233 690	425	-	-	-	-	-	-	-	-	106 379	486	-	-	340 069	911

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1991	189 324	341	-	-	-	-	-	-	-	-	82 532	370	-	-	271 856	711
	1992	108 901	199	-	-	-	-	-	-	-	-	66 357	323	-	-	175 258	522
	1993	91 239	159	-	-	-	-	-	-	-	-	45 416	214	-	-	136 655	373
	1994	76 973	139	-	-	-	-	-	-	-	-	42 946	216	-	-	119 919	355
	1995	61 940	107	-	-	-	-	-	-	-	-	34 263	153	-	-	96 203	260
	1996	82 490	138	-	-	-	-	-	-	-	-	31 590	154	-	-	114 080	292
	1997	58 988	103	-	-	-	-	-	-	-	-	26 270	126	-	-	85 258	229
	1998	51 251	87	-	-	-	-	-	-	-	-	13 274	70	-	-	64 525	157
	1999	50 901	88	-	-	-	-	-	-	-	-	11 368	64	-	-	62 269	152
	2000	55 263	95	-	-	-	-	-	-	-	-	10 571	58	-	-	65 834	153
	2001	51 225	86	-	-	-	-	-	-	-	-	11 575	61	-	-	62 800	147
	2002	53 464	99	-	-	-	-	-	-	-	-	8 439	49	-	-	61 903	148
	2003	46 768	81	-	-	-	-	-	-	-	-	11 218	60	-	-	57 986	141
	2004	54 253	94	-	-	-	-	-	-	-	-	12 933	68	-	-	67 186	162
	2005	47 368	83	-	-	-	-	-	-	-	-	10 937	56	-	-	58 305	139
	2006	46 747	82	-	-	-	-	-	-	-	-	11 248	55	-	-	57 995	137
	2007	37 075	63	-	-	-	-	-	-	-	-	10 311	49	-	-	47 386	112

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2008	58 386	100	-	-	-	-	-	-	-	-	11 736	57	-	-	70 122	158
	2009	42 943	74	-	-	-	-	-	-	-	-	11 226	52	-	-	54 169	126
	2010	58 531	100	-	-	-	-	-	-	-	-	10 972	53	-	-	69 503	153
	2011	63 756	110	-	-	-	-	-	-	-	-	13 668	69	-	-	77 424	179
	2012	43 192	74	-	-	-	-	-	-	-	-	10 980	52	-	-	54 172	126
	2013	41 311	72	-	-	-	-	-	-	-	-	13 887	66	-	-	55 198	138
	2014	44 171	77	-	-	-	-	-	-	-	-	8 756	41	-	-	52 926	118
	2015	48 838	86	-	-	-	-	-	-	-	-	11 473	54	-	-	60 311	140
	2016	45 265	79	-	-	-	-	-	-	-	-	11 716	56	-	-	56 981	135
	2017	31 314	55	-	-	-	-	-	-	-	-	11 563	55	-	-	42 876	110
	2018	21 802	39	-	-	-	-	-	-	-	-	8 548	39	-	-	30 350	79
	2019	27 387	48	-	-	-	-	-	-	-	-	9 588	46	-	-	36 975	94
USA	1982	33	-	1 206	-	5	-	-	-	-	-	-	-	21	-	1 265	6
	1983	26	-	314	1	2	-	-	-	-	-	-	-	6	-	348	1
	1984	50	-	545	2	2	-	-	-	-	-	-	-	12	-	609	2
	1985	23	-	528	2	2	-	-	-	-	-	-	-	13	-	566	2
	1986	76	-	482	2	2	-	-	-	-	-	-	-	3	-	563	2

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1987	33	-	229	1	10	-	-	-	-	-	-	-	10	-	282	1
	1988	49	-	203	1	3	-	-	-	-	-	-	-	4	-	259	1
	1989	157	0	325	1	2	-	-	-	-	-	-	-	3	-	487	2
	1990	52	0	562	2	12	-	-	-	-	-	-	-	16	-	642	2
	1991	48	0	185	1	1	-	-	-	-	-	-	-	4	-	238	1
	1992	54	0	138	1	1	-	-	-	-	-	-	-	-	-	193	1
	1993	17	-	133	1	0	0	-	-	-	-	-	-	2	-	152	1
	1994	12	-	0	0	0	0	-	-	-	-	-	-	-	-	12	0
	1995	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	1996	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	1997	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	1998	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	1999	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2000	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2001	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2002	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2003	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2004	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2005	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2006	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2007	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2008	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2009	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2010	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2011	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2012	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2013	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2014	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2015	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2016	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2017	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2018	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2019	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
Faroe	1982/83	9 086	-	101 227	-	21 663	-	448	-	29	-	-	-	-	-	132 453	625

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Islands	1983/84	4 791	-	107 199	-	12 469	-	49	-	-	-	-	-	-	-	124 508	651
	1984/85	324	-	123 510	-	9 690	-	-	-	-	-	-	-	1 653	-	135 177	598
	1985/86	1 672	-	141 740	-	4 779	-	76	-	-	-	-	-	6 287	-	154 554	545
	1986/87	76	-	133 078	-	7 070	-	80	-	-	-	-	-	-	-	140 304	539
	1987/88	5 833	-	55 728	-	3 450	-	0	-	-	-	-	-	-	-	65 011	208
	1988/89	1 351	-	86 417	-	5 728	-	0	-	-	-	-	-	-	-	93 496	309
	1989/90	1 560	-	103 407	-	6 463	-	6	-	-	-	-	-	-	-	111 436	364
	1990/91	631	-	52 420	-	4 390	-	8	-	-	-	-	-	-	-	57 449	202
	1991/92	16	-	7 611	-	837	-	-	-	-	-	-	-	-	-	8 464	31
	1992/93	-	-	4 212	-	1 203	-	-	-	-	-	-	-	-	-	5 415	22
	1993/94	-	-	1 866	-	206	-	-	-	-	-	-	-	-	-	2 072	7
	1994/95	-	-	1 807	-	156	-	-	-	-	-	-	-	-	-	1 963	6
	1995/96	-	-	268	-	14	-	-	-	-	-	-	-	-	-	282	1
	1996/97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
	1997/98	339	-	1 315	-	109	-	-	-	-	-	-	-	-	-	1 763	6
	1998/99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
	1999/00	225	-	1 560	-	205	-	-	-	-	-	-	-	-	-	1 990	8

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2000/01	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2001/02	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2002/03	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2003/04	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2004/05	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2005/06	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2006/07	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2007/08	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2008/09	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2009/10	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2010/11	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2011/12	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2012/13	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2013/14	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2014/15	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2015/16	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2016/17	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2017/18	1	-	1	-	1	-	-	-	-	-	-	-	-	-	0	0
	2018/19	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2019/20	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
Finland	1982	2 598	5	-	-	-	-	-	-	-	-	5 408	49	-	-	8 006	54
	1983	3 916	7	-	-	-	-	-	-	-	-	6 050	51	-	-	9 966	58
	1984	4 899	9	-	-	-	-	-	-	-	-	4 726	37	-	-	9 625	46
	1985	6 201	11	-	-	-	-	-	-	-	-	4 912	38	-	-	11 113	49
	1986	6 131	12	-	-	-	-	-	-	-	-	3 244	25	-	-	9 375	37
	1987	8 696	15	-	-	-	-	-	-	-	-	4 520	34	-	-	13 216	49
	1988	5 926	9	-	-	-	-	-	-	-	-	3 495	27	-	-	9 421	36
	1989	10 395	19	-	-	-	-	-	-	-	-	5 332	33	-	-	15 727	52
	1990	10 084	19	-	-	-	-	-	-	-	-	5 600	41	-	-	15 684	60
	1991	9 213	17	-	-	-	-	-	-	-	-	6 298	53	-	-	15 511	70
	1992	15 017	28	-	-	-	-	-	-	-	-	6 284	49	-	-	21 301	77
	1993	11 157	17	-	-	-	-	-	-	-	-	8 180	53	-	-	19 337	70
	1994	7 493	11	-	-	-	-	-	-	-	-	6 230	38	-	-	13 723	49
	1995	7 786	11	-	-	-	-	-	-	-	-	5 344	38	-	-	13 130	49

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1996	12 230	20	1 275	5	1 424	12	234	4	19	1	-	-	354	3	15 536	44
	1997	10 341	15	2 419	10	1 674	15	141	2	22	1	-	-	418	3	15 015	45
	1998	11 792	19	1 608	7	1 660	16	147	3	-	-	-	-	460	3	15 667	48
	1999	17 929	31	2 055	8	1 643	17	120	2	6	0	-	-	592	3	22 345	63
	2000	20 199	37	5 247	25	2 502	25	101	2	0	0	-	-	1 090	7	29 139	96
	2001	14 979	25	6 091	28	5 451	59	101	2	0	0	-	-	2 137	12	28 759	126
	2002	8 095	15	5 550	20	3 845	41	135	2	10	0	-	-	2 466	15	20 101	94
	2003	8 375	15	2 332	8	3 551	33	145	2	5	0	-	-	2 424	15	16 832	75
	2004	4 177	7	1 480	6	1 077	10	246	4	6	0	-	-	1 430	11	8 416	39
	2005	10 412	19	1 287	5	1 420	14	56	1	40	1	-	-	804	7	14 019	47
	2006	17 359	30	4 217	18	1 350	13	62	1	0	0	-	-	764	5	23 752	67
	2007	4 861	7	5 368	20	2 287	22	17	0	6	0	-	-	1 195	8	13 734	59
	2008	5 194	8	2 518	8	4 161	40	227	4	0	0	-	-	1 928	11	14 028	71
	2009	9 960	13	1 585	5	1 252	11	223	3	0	0	-	-	899	5	13 919	38
	2010	7 260	13	3 270	13	1 244	11	282	4	5	0	-	-	996	8	13 057	49
	2011	9 043	15	1 859	8	1 434	13	173	3	10	0	-	-	789	5	13 308	44
	2012	15 904	30	2 997	13	1 234	11	197	3	5	0	-	-	967	7	21 304	64

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2013	9 408	14	3 044	15	1 186	11	63	1	7	0	-	-	806	5	14 514	46
	2014	13 031	26	3 323	13	928	9	96	2	0	0	-	-	1 284	7	18 662	58
	2015	8 255	13	3 562	16	1 069	9	79	1	0	0	-	-	903	6	13 868	45
	2016	6 763	14	3 028	10	1 997	20	91	1	0	0	-	-	959	5	12 838	51
	2017	2 533	5	1 642	7	1 349	14	116	2	3	0			530	3	28 973	31
	2018	6 699	11	849	4	393	4	43	1	0	0	-	-	719	5	8704	24
	2019	2628	4	2205	8	310	3	27	1	4	0	-	-	727	5	5900	21
Iceland (3)	1991	29 601	-	11 892	-	-	-	-	-	-	-	-	-	-	-	41 493	130
	1992	38 538	-	15 312	-	-	-	-	-	-	-	-	-	-	-	53 850	175
	1993	36 640	-	11 541	-	-	-	-	-	-	-	-	-	-	-	48 181	160
	1994	24 224	59	14 088	76	-	-	-	-	-	-	-	-	-	-	38 312	135
	1995	32 767	90	13 136	56	-	-	-	-	-	-	-	-	-	-	45 903	145
	1996	26 927	66	9 785	52	-	-	-	-	-	-	-	-	-	-	36 712	118
	1997	21 684	56	8 178	41	-	-	-	-	-	-	-	-	-	-	29 862	97
	1998	32 224	81	7 272	37	-	-	-	-	-	-	-	-	-	-	39 496	119
	1999	22 620	59	9 883	52	-	-	-	-	-	-	-	-	-	-	32 503	111
	2000	20 270	49	4 319	24	-	-	-	-	-	-	-	-	-	-	24 589	73

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2001	18 538	46	5 289	28	-	-	-	-	-	-	-	-	-	-	23 827	74
	2002	25 277	64	5 194	26	-	-	-	-	-	-	-	-	-	-	30 471	90
	2003	24 738	61	8 119	37	-	-	-	-	-	-	-	-	-	-	32 857	99
	2004	32 600	84	6 128	28	-	-	-	-	-	-	-	-	-	-	38 728	111
	2005	39 980	101	5 941	28	-	-	-	-	-	-	-	-	-	-	45 921	129
	2006	29 857	71	5 635	23	-	-	-	-	-	-	-	-	-	-	35 492	93
	2007	31 899	74	3 262	15	-	-	-	-	-	-	-	-	-	-	35 161	89
	2008	44 391	106	5 129	26	-	-	-	-	-	-	-	-	-	-	49 520	132
	2009	43 981	103	4 561	24	-	-	-	-	-	-	-	-	-	-	48 542	126
	2010	43 457	105	9 251	43	-	-	-	-	-	-	-	-	-	-	52 708	147
	2011	28 550	74	4 854	24	-	-	-	-	-	-	-	-	-	-	33 404	98
	2012	17 011	15	2 848	14	-	-	-	-	-	-	-	-	-	-	19 859	29
	2013	40 412	97	4 274	19	-	-	-	-	-	-	-	-	-	-	44 686	116
	2014	13 593	29	3 317	17	-	-	-	-	-	-	-	-	-	-	16 910	47
	2015	33 713	78	3 201	16	-	-	-	-	-	-	-	-	-	-	36 914	94
	2016	14 410	32	3 445	18	-	-	-	-	-	-	-	-	-	-	17 855	51
	2017	20 226	45	3 726	14.7	-	-	-	-	-	-	-	-	-	-	23 955	66

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2018	20 229	51	8 944	23	-	-	-	-	-	-	-	-	-	-	21 414	62
	2019	6 372	14	1 049	5	-	-	-	-	-	-	-	-	-	-	7 421	19.3
Sweden	1990	7 430	18	-	-	-	-	-	-	-	-	3 135	15	-	-	10 565	33
	1991	8 990	20	-	-	-	-	-	-	-	-	3 620	18	-	-	12 610	38
	1992	9 850	23	-	-	-	-	-	-	-	-	4 655	26	-	-	14 505	49
	1993	10 540	23	-	-	-	-	-	-	-	-	6 370	33	-	-	16 910	56
	1994	8 035	18	-	-	-	-	-	-	-	-	4 660	26	-	-	12 695	44
	1995	9 761	22	-	-	-	-	-	-	-	-	2 770	14	-	-	12 531	36
	1996	6 008	14	-	-	-	-	-	-	-	-	3 542	19	-	-	9 550	33
	1997	2 747	7	-	-	-	-	-	-	-	-	2 307	12	-	-	5 054	19
	1998	2 421	6	-	-	`	-	-	-	-	-	1 702	9	-	-	4 123	15
	1999	3 573	8	-	-	-	-	-	-	-	-	1 460	8	-	-	5 033	16
	2000	7 103	18	-	-	-	-	-	-	-	-	3 196	15	-	-	10 299	33
	2001	4 634	12	-	-	-	-	-	-	-	-	3 853	21	-	-	8 487	33
	2002	4 733	12	-	-	-	-	-	-	-	-	2 826	16	-	-	7 559	28
	2003	2 891	7	-	-	-	-	-	-	-	-	3 214	18	-	-	6 105	25
	2004	2 494	6	-	-	-	-	-	-	-	-	2 330	13	-	-	4 824	19

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2005	2 122	5	-	-	-	-	-	-	-	-	1 770	10	-	-	3 892	15
	2006	2 585	4	-	-	-	-	-	-	-	-	1 772	10	-	-	4 357	14
	2007	1 228	3	-	-	-	-	-	-	-	-	2 442	13	-	-	3 670	16
	2008	1 197	3	-	-	-	-	-	-	-	-	2 752	16	-	-	3 949	18
	2009	1 269	3	-	-	-	-	-	-	-	-	2 495	14	-	-	3 764	17
	2010	2 109	5	-	-	-	-	-	-	-	-	3 066	17	-	-	5 175	22
	2011	2 726	7	-	-	-	-	-	-	-	-	5 759	32	-	-	8 485	39
	2012	1 900	5	-	-	-	-	-	-	-	-	4 826	25	-	-	6 726	30
	2013	1 052	3	-	-	-	-	-	-	-	-	1 996	12	-	-	3 048	15
	2014	2 887	8	-	-	-	-	-	-	-	-	3 657	22	-	-	6 544	30
	2015	1 028	2	-	-	-	-	-	-	-	-	2 569	15	-	-	3 597	18
	2016	742	2	-	-	-	-	-	-	-	-	1 389	7	-	-	2 131	9
	2017	999	3	-	-	-	-	-	-	-	-	2 473	15	-	-	3 472	16
	2018	1 304	3	-	-	-	-	-	-	-	-	1 626	10	-	-	2 930	13
	2019	751	2	-	-	-	-	-	-	-	-	2 638	15	-	-	3 389	17
Norway	1981	221 566	467	-	-	-	-	-	-	-	-	213 943	1 189	-	-	435 509	1 656
	1982	163 120	363	-	-	-	-	-	-	-	-	174 229	985	-	-	337 349	1 348

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1983	278 061	593	-	-	-	-	-	-	-	-	171 361	957	-	-	449 422	1 550
	1984	294 365	628	-	-	-	-	-	-	-	-	176 716	995	-	-	471 081	1 623
	1985	299 037	638	-	-	-	-	-	-	-	-	162 403	923	-	-	461 440	1 561
	1986	264 849	556	-	-	-	-	-	-	-	-	191 524	1 042	-	-	456 373	1 598
	1987	235 703	491	-	-	-	-	-	-	-	-	153 554	894	-	-	389 257	1 385
	1988	217 617	420	-	-	-	-	-	-	-	-	120 367	656	-	-	337 984	1 076
	1989	220 170	436	-	-	-	-	-	-	-	-	80 880	469	-	-	301 050	905
	1990	192 500	385	-	-	-	-	-	-	-	-	91 437	545	-	-	283 937	930
	1991	171 041	342	-	-	-	-	-	-	-	-	92 214	535	-	-	263 255	877
	1992	151 291	301	-	-	-	-	-	-	-	-	92 717	566	-	-	244 008	867
	1993	153 407	312	62 403	284	35 147	327	-	-	-	-	-	-	-	-	250 957	923
	1994	-	415	-	319	-	262	-	-	-	-	-	-	-	-	-	996
	1995	134 341	249	71 552	341	27 104	249	-	-	-	-	-	-	-	-	232 997	839
	1996	110 085	215	69 389	322	27 627	249	-	-	-	-	-	-	-	-	207 101	786
	1997	124 387	241	52 842	238	16 448	151	-	-	-	-	-	-	-	-	193 677	630
	1998	162 185	296	66 767	306	15 568	139	-	-	-	-	-	-	-	-	244 520	741
	1999	164 905	318	70 825	326	18 669	167	-	-	-	-	-	-	-	-	254 399	811

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2000	250 468	504	99 934	454	24 319	219	-	-	-	-	-	-	-	-	374 721	1 177
	2001	207 934	417	117 759	554	33 047	295	-	-	-	-	-	-	-	-	358 740	1 266
	2002	127 039	249	98 055	471	33 013	299	-	-	-	-	-	-	-	-	258 107	1 019
	2003	185 574	363	87 993	410	31 099	298	-	-	-	-	-	-	-	-	304 666	1 071
	2004	108 645	207	77 343	371	23 173	206	-	-	-	-	-	-	-	-	209 161	784
	2005	165 900	307	69 488	320	27 507	261	-	-	-	-	-	-	-	-	262 895	888
	2006	142 218	261	99 401	453	23 529	218	-	-	-	-	-	-	-	-	265 148	932
	2007	78 165	140	79 146	363	28 896	264	-	-	-	-	-	-	-	-	186 207	767
	2008	89 228	170	69 027	314	34 124	322	-	-	-	-	-	-	-	-	192 379	807
	2009	73 045	135	53 725	241	23 663	219	-	-	-	-	-	-	-	-	150 433	595
	2010	98 490	184	56 260	250	22 310	208	-	-	-	-	-	-	-	-	177 060	642
	2011	71 597	140	81 351	374	20 270	183	-	-	-	-	-	-	-	-	173 218	696
	2012	81 638	162	63 985	289	26 689	245	-	-	-	-	-	-	-	-	172 312	696
	2013	70 059	117	49 264	227	14 367	131	-	-	-	-	-	-	-	-	133 690	475
	2014	85 419	171	47 347	203	12 415	116	-	-	-	-	-	-	-	-	145 181	490
	2015	83 196	153	64 069	296	15 407	134	-	-	-	-	-	-	-	-	162 672	583
	2016	65 470	117	69 167	321	19 406	174	-	-	-	-	-	-	-	-	154 043	612

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2017	83 032	164	67 761	307	20 913	196	-	-	-	-	-	-	-	-	171 706	667
	2018	84 348	167	62 447	289	15 247	138	-	-	-	-	-	-	-	-	162 042	594
	2019	67 097	122	53 239	244	15 889	147	-	-	-	-	-	-	-	-	136 225	513
Russia	1987	97 242	-	27 135	-	9 539	-	556	-	18	-	-	-	2 521	-	137 011	564
	1988	53 158	-	33 395	-	10 256	-	294	-	25	-	-	-	2 937	-	100 065	420
	1989	78 023	-	23 123	-	4 118	-	26	-	0	-	-	-	2 187	-	107 477	364
	1990	70 595	-	20 633	-	2 919	-	101	-	0	-	-	-	2 010	-	96 258	313
	1991	40 603	-	12 458	-	3 060	-	650	-	0	-	-	-	1 375	-	58 146	215
	1992	34 021	-	8 880	-	3 547	-	180	-	0	-	-	-	824	-	47 452	167
	1993	28 100	-	11 780	-	4 280	-	377	-	0	-	-	-	1 470	-	46 007	139
	1994	30 877	-	10 879	-	2 183	-	51	-	0	-	-	-	555	-	44 545	141
	1995	27 775	62	9 642	50	1 803	15	6	0	0	0	-	-	385	2	39 611	129
	1996	33 878	79	7 395	42	1 084	9	40	1	0	0	-	-	41	1	42 438	131
	1997	31 857	72	5 837	28	672	6	38	1	0	0	-	-	559	3	38 963	110
	1998	34 870	92	6 815	33	181	2	28	0	0	0	-	-	638	3	42 532	130
	1999	24 016	66	5 317	25	499	5	0	0	0	0	-	-	1 131	6	30 963	102
	2000	27 702	75	7 027	34	500	5	3	0	0	0	-	-	1 853	9	37 085	123

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2001	26 472	61	7 505	39	1 036	10	30	0	0	0	-	-	922	5	35 965	115
	2002	24 588	60	8 720	43	1 284	12	3	0	0	0	-	-	480	3	35 075	118
	2003	22 014	50	8 905	42	1 206	12	20	0	0	0	-	-	634	4	32 779	107
	2004	17 105	39	6 786	33	880	7	0	0	0	0	-	-	529	3	25 300	82
	2005	16 591	39	7 179	33	989	8	1	0	0	0	-	-	439	3	25 199	82
	2006	22 412	54	5 392	28	759	6	0	0	0	0	-	-	449	3	29 012	91
	2007	12 474	30	4 377	23	929	7	0	0	0	0	-	-	277	2	18 057	62
	2008	13 404	28	8 674	39	669	4	8	0	0	0	-	-	312	2	23 067	73
	2009	13 580	30	7 215	35	720	5	36	0	0	0	-	-	173	1	21 724	71
	2010	14 834	33	9 821	48	844	6	49	0	0	0	-	-	186	1	25 734	88
	2011	13 779	31	9 030	44	747	5	51	0	0	0	-	-	171	1	23 778	82
	2012	17 484	42	6 560	34	738	5	53	0	0	0	-	-	173	1	25 008	83
	2013	14 576	35	6 938	36	857	6	27	0	0	0	-	-	93	1	22 491	78
	2014	15 129	35	7 936	38	1 015	7	34	0	0	0	-	-	106	1	24 220	81
	2015	15 011	38	7 082	36	723	5	19	0	0	0	-	-	277	1	23 112	80
	2016	11 064	28	4 716	22	621	4	23	0	0	0	-	-	289	2	16 713	56
	2017	5 592	14	5 930	28	644	4	7	0	0	9	-	-	90	0	12 263	56

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2018	12 626	30	9 355	43	820	5	13	0	0	0	-	-	232	1	23 046	80
	2019	8 720	21	6 145	30	588	4	15	0	0	0	-	-	136	1	15 604	57
Ireland	1980	248 333	745	-	-	-	-	-	-	-	-	39 608	202	-	-	287 941	947
	1981	173 667	521	-	-	-	-	-	-	-	-	32 159	164	-	-	205 826	685
	1982	310 000	930	-	-	-	-	-	-	-	-	12 353	63	-	-	322 353	993
	1983	502 000	1 506	-	-	-	-	-	-	-	-	29 411	150	-	-	531 411	1 656
	1984	242 666	728	-	-	-	-	-	-	-	-	19 804	101	-	-	262 470	829
	1985	498 333	1 495	-	-	-	-	-	-	-	-	19 608	100	-	-	517 941	1 595
	1986	498 125	1 594	-	-	-	-	-	-	-	-	28 335	136	-	-	526 460	1 730
	1987	358 842	1 112	-	-	-	-	-	-	-	-	27 609	127	-	-	386 451	1 239
	1988	559 297	1 733	-	-	-	-	-	-	-	-	30 599	141	-	-	589 896	1 874
	1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	330 558	1 079
	1990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	188 890	567
	1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	135 474	404
	1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	235 435	631
	1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200 120	541
	1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	286 266	804

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	288 225	790
	1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249 623	685
	1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209 214	570
	1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237 663	624
	1999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180 477	515
	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228 220	621
	2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270 963	730
	2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	256 808	682
	2003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	204 145	551
	2004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180 953	489
	2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156 308	422
	2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120 834	326
	2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30 946	84
	2008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33 200	89
	2009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25 170	68
	2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36 508	99
	2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32 308	87

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32 599	88
	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32 303	87
	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20 883	56
	2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23 416	63
	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21 504	58
	2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26 714	72
	2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21 425	58
	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14 293	39
UK	1985	62 815	-	-	-	-	-	-	-	-	-	32 716	-	-	-	95 531	361
UK(England	1986	68 759	-	-	-	-	-	-	-	-	-	42 035	-	-	-	110 794	430
& Wales)	1987	56 739	-	-	-	-	-	-	-	-	-	26 700	-	-	-	83 439	302
	1988	76 012	-	-	-	-	-	-	-	-	-	34 151	-	-	-	110 163	395
	1989	54 384	-	-	-	-	-	-	-	-	-	29 284	-	-	-	83 668	296
	1990	45 072	-	-	-	-	-	-	-	-	-	41 604	-	-	-	86 676	338
	1991	36 671	-	-	-	-	-	-	-	-	-	14 978	-	-	-	51 649	200
	1992	34 331	-	-	-	-	-	-	-	-	-	10 255	-	-	-	44 586	171
	1993	56 033	-	-	-	-	-	-	-	-	-	13 144	-	-	-	69 177	248

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1994	67 853	-	-	-	-	-	-	-	-	-	20 268	-	-	-	88 121	324
	1995	57 944	-	-	-	-	-	-	-	-	-	22 534	-	-	-	80 478	295
	1996	30 352	-	-	-	-	-	-	-	-	-	16 344	-	-	-	46 696	183
	1997	30 203	-	-	-	-	-	-	-	-	-	11 171	-	-	-	41 374	142
	1998	30 272	-	-	-	-	-	-	-	-	-	6 645	-	-	-	36 917	123
	1999	27 953	-	-	-	-	-	-	-	-	-	13 154	-	-	-	41 107	150
	2000	48 153	-	-	-	-	-	-	-	-	-	12 800	-	-	-	60 953	219
	2001	38 480	-	-	-	-	-	-	-	-	-	12 827	-	-	-	51 307	184
	2002	34 708	-	-	-	-	-	-	-	-	-	10 961	-	-	-	45 669	161
	2003	14 656	-	-	-	-	-	-	-	-	-	7 550	-	-	-	22 206	89
	2004	24 753	-	-	-	-	-	-	-	-	-	5 806	-	-	-	30 559	111
	2005	19 883	-	-	-	-	-	-	-	-	-	6 279	-	-	-	26 162	97
	2006	17 204	-	-	-	-	-	-	-	-	-	4 852	-	-	-	22 056	80
	2007	15 540	-	-	-	-	-	-	-	-	-	4 383	-	-	-	19 923	67
	2008	14 467	-	-	-	-	-	-	-	-	-	4 569	-	-	-	19 036	64
	2009	10 015	-	-	-	-	-	-	-	-	-	3 895	-	-	-	13 910	54
	2010	25 502	-	-	-	-	-	-	-	-	-	7 193	-	-	-	32 695	109

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2011	19 708	-	-	-	-	-	-	-	-	-	14 867	-	-	-	34 575	136
	2012	7 493	-	-	-	-	-	-	-	-	-	7 433	-	-	-	14 926	58
	2013	13 113	-	-	-	-	-	-	-	-	-	9 495	-	-	-	22 608	84
	2014	7 678	-	-	-	-	-	-	-	-	-	6 541	-	-	-	14 219	54
	2015	9 053	-	-	-	-	-	-	-	-	-	10 209	-	-	-	19 262	68
	2016	9 447	-	-	-	-	-	-	-	-	-	13 047	-	-	-	22 494	86
	2017	4 866	-	-	-	-	-	-	-	-	-	7 298	-	-	-	12 164	49
	2018	5 052	-	-	-	-	-	-	-	-	-	6 174	-	-	-	11 226	42
	2019	634	-	-	-	-	-	-	-	-	-	808	-	-	-	1 142	5
UK	1982	208 061	496	-	-	-	-	-	-	-	-	128 242	596	-	-	336 303	1 092
(Scotland)	1983	209 617	549	-	-	-	-	-	-	-	-	145 961	672	-	-	355 578	1 221
	1984	213 079	509	-	-	-	-	-	-	-	-	107 213	504	-	-	320 292	1 013
	1985	158 012	399	-	-	-	-	-	-	-	-	114 648	514	-	-	272 660	913
	1986	202 838	525	-	-	-	-	-	-	-	-	148 197	744	-	-	351 035	1 269
	1987	164 785	419	-	-	-	-	-	-	-	-	103 994	503	-	-	268 779	922
	1988	149 098	381	-	-	-	-	-	-	-	-	112 162	501	-	-	261 260	882
	1989	174 941	431	-	-	-	-	-	-	-	-	103 886	464	-	-	278 827	895

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1990	81 094	201	-	-	-	-	-	-	-	-	87 924	423	-	-	169 018	624
	1991	73 608	177	-	-	-	-	-	-	-	-	65 193	285	-	-	138 801	462
	1992	101 676	238	-	-	-	-	-	-	-	-	82 841	361	-	-	184 517	600
	1993	94 517	227	-	-	-	-	-	-	-	-	71 726	320	-	-	166 243	547
	1994	99 479	248	-	-	-	-	-	-	-	-	85 404	400	-	-	184 883	648
	1995	89 971	224	-	-	-	-	-	-	-	-	78 511	364	-	-	168 482	588
	1996	66 465	160	-	-	-	-	-	-	-	-	57 998	267	-	-	124 463	427
	1997	46 866	114	-	-	-	-	-	-	-	-	40 459	182	-	-	87 325	296
	1998	53 503	121	-	-	-	-	-	-	-	-	39 264	162	-	-	92 767	283
	1999	25 255	57	-	-	-	-	-	-	-	-	30 694	143	-	-	55 949	199
	2000	44 033	114	-	-	-	-	-	-	-	-	36 767	161	-	-	80 800	275
	2001	42 586	101	-	-	-	-	-	-	-	-	34 926	150	-	-	77 512	251
	2002	31 385	73	-	-	-	-	-	-	-	-	26 403	118	-	-	57 788	191
	2003	29 598	71	-	-	-	-	-	-	-	-	27 588	122	-	-	57 091	192
	2004	37 631	88	-	-	-	-	-	-	-	-	36 856	159	-	-	74 033	245
	2005	39 093	91	-	-	-	-	-	-	-	-	28 666	126	-	-	67 117	215
	2006	36 668	75	-	-	-	-	-	-	-	-	27 620	118	-	-	63 848	192

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2007	32 335	71	-	-	-	-	-	-	-	-	24 098	100	-	-	56 433	171
	2008	23 431	51	-	-	-	-	-	-	-	-	25 745	110	-	-	49 176	161
	2009	18 189	37	-	-	-	-	-	-	-	-	19 185	83	-	-	37 374	121
	2010	33 426	69	-	-	-	-	-	-	-	-	26 988	111	-	-	60 414	180
	2011	15 706	33	-	-	-	-	-	-	-	-	28 496	126	-	-	44 202	159
	2012	19 371	40	-	-	-	-	-	-	-	-	19 785	84	-	-	39 156	124
	2013	20 747	45	-	-	-	-	-	-	-	-	17 223	74	-	-	37 970	119
	2014	12 581	26	-	-	-	-	-	-	-	-	13 329	58	-	-	25 910	84
	2015	13 659	29	-	-	-	-	-	-	-	-	9 165	39	-	-	22 824	68
	2016	4 220	8	-	-	-	-	-	-	-	-	4 163	19	-	-	8 383	27
	2017	3 727	8	-	-	-	-	-	-	-	-	4 419	19	-	-	8 146	27
	2018	3 834	8	-	-	-	-	-	-	-	-	2 578	12	-	-	6 412	19
	2019	2 499	5	-	-	-	-	-	-	-	-	1 926	8	-	-	4 425	13
France	1987	6 013	18	-	-	-	-	-	-	-	-	1 806	9	-	-	7 819	27
	1988	2 063	7	-	-	-	-	-	-	-	-	4 964	25	-	-	7 027	32
	1989	1 124	3	1 971	9	311	2	-	-	-	-	-	-	-	-	3 406	14
	1990	1 886	5	2 186	9	146	1	-	-	-	-	-	-	-	-	4 218	15

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1991	1 362	3	1 935	9	190	1	-	-	-	-	-	-	-	-	3 487	13
	1992	2 490	7	2 450	12	221	2	-	-	-	-	-	-	-	-	5 161	21
	1993	3 581	10	987	4	267	2	-	-	-	-	-	-	-	-	4 835	16
	1994	2 810	7	2 250	10	40	1	-	-	-	-	-	-	-	-	5 100	18
	1995	1 669	4	1 073	5	22	0	-	-	-	-	-	-	-	-	2 764	10
	1996	2 063	5	1 891	9	52	0	-	-	-	-	-	-	-	-	4 006	13
	1997	1 060	3	964	5	37	0	-	-	-	-	-	-	-	-	2 061	8
	1998	2 065	5	824	4	22	0	-	-	-	-	-	-	-	-	2 911	8
	1999	690	2	1 799	9	32	0	-	-	-	-	-	-	-	-	2 521	11
	2000	1 792	4	1 253	6	24	0	-	-	-	-	-	-	-	-	3 069	11
	2001	1 544	4	1 489	7	25	0	-	-	-	-	-	-	-	-	3 058	11
	2002	2 423	6	1 065	5	41	0	-	-	-	-	-	-	-	-	3 529	11
	2003	1 598	5	-	-	-	-	-	-	-	-	1 540	8	-	-	3 138	13
	2004	1 927	5	-	-	-	-	-	-	-	-	2 880	14	-	-	4 807	19
	2005	1 236	3	-	-	-	-	-	-	-	-	1 771	8	-	-	3 007	11
	2006	1 763	3	-	-	-	-	-	-	-	-	1 785	9	-	-	3 548	13
	2007	1 378	3	-	-	-	-	-	-	-	-	1 685	9	-	-	3 063	12

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2008	1 471	3	-	-	-	-	-	-	-	-	1 931	9	-	-	3 402	12
	2009	487	1	-	-	-	-	-	-	-	-	975	4	-	-	1 462	5
	2010	1 658	4	-	-	-	-	-	-	-	-	821	4	-	-	2 479	7
	2011	1 145	3	-	-	-	-	-	-	-	-	2 126	9	-	-	3 271	11
	2012	1 010	2	-	-	-	-	-	-	-	-	1 669	7	-	-	2 679	10
	2013	1 457	3	-	-	-	-	-	-	-	-	1 679	7	-	-	3 136	10
	2014	1 469	3	-	-	-	-	-	-	-	-	2 159	9	-	-	3 628	12
	2015	1 239	3	-	-	-	-	-	-	-	-	2 435	9	-	-	3 674	12
	2016	1 017	2	-	-	-	-	-	-	-	-	972	4	-	-	1 989	6
	2017	1 524	4	-	-	-	-	-	-	-	-	986	5	-	-	2 510	9
	2018	1 071	4	-	-	-	-	-	-	-	-	1 678	7	-	-	2 749	11
	2019	1 105	4	-	-	-	-	-	-	-	-	2 362	9	-	-	2 749	13
Spain (2)	1993	1 589	-	827	-	75	-	-	-	-	-	-	-	-	-	2 491	8
	1994	1 658	5	-	-	-	-	-	-	-	-	735	4	-	-	2 393	9
	1995	389	1	-	-	-	-	-	-	-	-	1 118	6	-	-	1 507	7
	1996	349	1	-	-	-	-	-	-	-	-	676	3	-	-	1 025	4
	1997	169	0	-	-	-	-	-	-	-	-	425	2	-	-	594	3

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	1998	481	1	-	-	-	-	-	-	-	-	403	2	-	-	884	3
	1999	157	0	-	-	-	-	-	-	-	-	986	5	-	-	1 143	6
	2000	1 227	3	-	-	-	-	-	-	-	-	433	3	-	-	1 660	6
	2001	1 129	3	-	-	-	-	-	-	-	-	1 677	9	-	-	2 806	12
	2002	651	2	-	-	-	-	-	-	-	-	1 085	6	-	-	1 736	8
	2003	210	1	-	-	-	-	-	-	-	-	1 116	6	-	-	1 326	6
	2004	1 053	3	-	-	-	-	-	-	-	-	731	4	-	-	1 784	6
	2005	412	1	-	-	-	-	-	-	-	-	2 336	11	-	-	2 748	12
	2006	350	1	-	-	-	-	-	-	-	-	1 864	9	-	-	2 214	10
	2007	481	1	-	-	-	-	-	-	-	-	1 468	7	-	-	1 949	8
	2008	162	0	-	-	-	-	-	-	-	-	1 371	7	-	-	1 533	7
	2009	106	0	-	-	-	-	-	-	-	-	250	1	-	-	356	1
	2010	81	0	-	-	-	-	-	-	-	-	166	1	-	-	247	1
	2011	18	0	-	-	-	-	-	-	-	-	1 027	5	-	-	1 045	5
	2012	237	1	-	-	-	-	-	-	-	-	1 064	6	-	-	1 301	6
	2013	111	0	-	-	-	-	-	-	-	-	725	4	-	-	836	4
	2014	48	0	-	-	-	-	-	-	-	-	1 160	6	-	-	1 208	6

		1SW		2SW		3SW		4SW		5SW		MSW (1)		PS		Total	
Country	Year	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
	2015	46	0	-	-	-	-	-	-	-	-	1 048	5	-	-	1 094	5
	2016	332	1	-	-	-	-	-	-	-	-	806	4	-	-	1 138	5
	2017	140	0	-	-	-	-	-	-	-	-	358	2	-	-	498	2
	2018	123	0	-	-	-	-	-	-	-	-	477	3	-	-	600	3
	2019	125	0	-	-	-	-	-	-	-	-	866	4	-	-	991	5

1. MSW includes all sea ages >1, when this cannot be broken down.

Different methods are used to separate 1SW and MSW salmon in different countries:

- Scale reading: Faroe Islands, Finland (1996 onwards), France, Russia, USA and West Greenland.

- Size (split weight/length): Canada (2.7 kg for nets; 63 cm for rods), Finland up until 1995 (3 kg),

Iceland (various splits used at different times and places), Norway (3 kg), UK Scotland (3 kg in some places and 3.7 kg in others),

All countries except Scotland report no problems with using weight to categorise catches into sea-age classes; misclassification may be very high in some years.

In Norway, catches shown as 3SW refer to salmon of 3SW or greater.

2. Based on catches in Asturias (80–90% of total catch) 1993–2018, and on catches for all Spain in 2019 and mixed age catches assigned to MSW.

3. Iceland catches of wild fish only, i.e. excluding ranched fish.

Annex 5: WGNAS Stock Annex for Atlantic salmon

The table below provides an overview of the WGNAS Stock Annex. Stock Annexes for other stocks are available on the ICES website Library under the Publication Type "Stock Annexes". Use the search facility to find a particular Stock Annex, refining your search in the left-hand column to include the *year*, *ecoregion*, *species*, and *acronym* of the relevant ICES expert group.

Stock ID	Stock name	Last updated	Link
sal-nea	Atlantic Salmon	April 2019	Salmo salar

Annex 6: Glossary of acronyms used in this report

1SW (*One-Sea-Winter*). Maiden adult salmon that has spent one winter at sea.

2SW (*Two-Sea-Winter*). Maiden adult salmon that has spent two winters at sea.

ACOM (*Advisory Committee*) of ICES. The Committee works on the basis of scientific assessment prepared in the ICES expert groups. The advisory process includes peer review of the assessment before it can be used as the basis for advice. The Advisory Committee has one member from each member country under the direction of an independent chair appointed by the Council.

ASC (Annual Science Conference of ICES).

CL (*Conservation Limit*). Demarcation of undesirable stock levels or levels of fishing activity; the ultimate objective when managing stocks and regulating fisheries will be to ensure that there is a high probability that undesirable levels are avoided.

CPUE (*Catch per Unit of Effort*). A derived quantity obtained from the independent values of catch and effort.

C&R (*Catch and Release*). Catch and release is a practice within recreational fishing intended as a technique of conservation. After capture, the fish are unhooked and returned to the water before experiencing serious exhaustion or injury. Using barbless hooks, it is often possible to release the fish without removing it from the water (a slack line is frequently sufficient).

CWT (*Coded Wire Tag*). The CWT is a length of magnetized stainless steel wire 0.25 mm in diameter. The tag is marked with rows of numbers denoting specific batch or individual codes. Tags are cut from rolls of wire by an injector that hypodermically implants them into suitable tissue. The standard length of a tag is 1.1 mm.

DCF (*Data Collection Framework*). Framework under which EU Member States collect, manage and make available a wide range of fisheries data needed for scientific advice.

DC-MAP (Data Collection Multi-Annual Programme). Framework under which EU Member States collect, manage and make available a wide range of fisheries data needed for scientific advice.

DFO *(Department of Fisheries and Oceans*). DFO and its Special Operating Agency, the Canadian Coast Guard, deliver programs and services that support sustainable use and development of Canada's waterways and aquatic resources.

DNA (*Deoxyribonucleic Acid*). DNA is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms (with the exception of RNA-Ribonucleic Acid viruses). The main role of DNA molecules is the long-term storage of information. DNA is often compared to a set of blueprints, like a recipe or a code, since it contains the instructions needed to construct other components of cells, such as proteins and RNA molecules.

DSG (*diadromous subgroup*). Pan-regional subgroup within the Regional Coordination Groups to coordinate and identify data collection needs for diadromous species in relation to the EU data collection regulation Data Collection Framework/Data Collection-Multi-Annual Programme.

DST *(Data Storage Tag*). A miniature data logger with sensors including salinity, temperature, and depth that is attached to fish and other marine animals.

FAO (*Food and Agriculture Organization of the United Nations*).

FSC (*Food, Social and Ceremonial fishery*). Indigenous fishery in Canada for food, social or ceremonial purposes.

FWI (*Framework of Indicators*). The FWI is a tool used to indicate if any significant change in the status of stocks used to inform the previously provided multiannual management advice has occurred.

GFLK (*Greenland Fisheries Licence Control Authority*).

GLM (*Generalised Linear Model*). A conventional linear regression model for a continuous response variable given continuous and/or categorical predictors.

ICES (*International Council for the Exploration of the Sea*). A global organisation that develops science and advice to support the sustainable use of the oceans through the coordination of oceanic and coastal monitoring and research, and advising international commissions and governments on marine policy and management issues.

LAB / Lab (*Labrador*). Labrador, Canada.

MSW (*Multi-Sea-Winter*). A MSW salmon is an adult salmon, which has spent two or more winters at sea and may be a repeat spawner.

NAC (*North American Commission*). The North American Atlantic Commission of NASCO or the North American Commission area of NASCO.

NAFO (*Northwest Atlantic Fisheries Organisation*). NAFO is an intergovernmental fisheries science and management organization that ensures the long-term conservation and sustainable use of the fishery resources in the Northwest Atlantic.

NASCO (*North Atlantic Salmon Conservation Organisation*). An international organisation, established by an inter-governmental convention in 1984. The objective of NASCO is to conserve, restore, enhance and rationally manage Atlantic salmon through international cooperation taking account of the best available scientific information.

NCC (*NunatuKavut Community Council*). NCC is one of four subsistence fisheries harvesting salmonids in Labrador.

NEAC (*North Eastern Atlantic Commission*). North-East Atlantic Commission of NASCO or the North-East Atlantic Commission area of NASCO.

NEAC – N (*North Eastern Atlantic Commission- northern area*). The northern portion of the North-East Atlantic Commission area of NASCO.

NEAC – S (*North Eastern Atlantic Commission – southern area*). The southern portion of the North-East Atlantic Commission area of NASCO.

NF (*Newfoundland*). Newfoundland, Canada.

NG (*Nunatsiavut Government*). NG is one of four subsistence fisheries harvesting salmonids in Labrador. NG members are fishing in the northern Labrador communities.

PFA (*Pre-Fishery Abundance*). The numbers of salmon estimated to be alive in the ocean from a particular stock at a specified time. In the previous version of the stock complex Bayesian PFA forecast model two productivity parameters are calculated, for the *maturing* (PFAm) and *non-maturing* (PFAnm) components of the PFA. In the updated version only one productivity parameter is calculated, and used to calculate total PFA, which is then split into PFAm and PFAnm based upon the *proportion of PFAm* (p.PFAm).

PFANAC1SW (*PFA NAC 1SW*). The non-maturing component of 1SW salmon, destined to be 2SW returns (excluding 3SW and previous spawners) is represented by the PFA estimate for year i.

PIT (*Passive Integrated Transponder*). PIT tags use radio frequency identification technology. PIT tags lack an internal power source. They are energized on encountering an electromagnetic field emitted from a transceiver. The tag's unique identity code is programmed into the microchip's non-volatile memory.

RCG (*Regional Coordination Group*). Group(s) that coordinate and identify data collection needs in relation to the EU data collection regulations.

RDB *(Regional Database).*

RDBES *(Regional Database and Estimation System)***.**

SAC (*Special Area of Conservation*). Strictly protected site designated under the European Committee Habitats Directive.

SE (*standard error*).

SER (*Spawning Escapement Reserve*). The CL increased to take account of natural mortality between the recruitment date (assumed to be 1st January) and the date of return to homewaters.

SFA *(Salmon Fishing Areas).* Areas for which the Department of Fisheries and Oceans (DFO) Canada manages the salmon fisheries.

SNP (*Single Nucleotide Polymorphism*). Type of genetic marker used in stock identification and population genetic studies.

ToR (*Terms of reference*).

UK (*United Kingdom and Northern Ireland*). Country in Europe.

WGC (*West Greenland Commission*). The West Greenland Commission of NASCO or the West Greenland Commission area of NASCO.

WGNAS (*Working Group on North Atlantic Salmon*). ICES working group responsible for the annual assessment of the status of salmon stocks across the North Atlantic and formulating catch advice for NASCO.

Annex 7: Data deficiencies, monitoring needs and research requirements

The Working Group recommends that it should meet in 2021 (Chair, Dennis Ensing, UK Northern Ireland) to address questions posed by ICES, including those posed by NASCO. In the absence of a formal invitation elsewhere, the Working Group intends to convene in the headquarters of ICES in Copenhagen, Denmark. The meeting will be held from 22 March–31 March 2021.

List of recommendations

1. The Working Group recommends the creation of a database listing individual PIT tag numbers or codes identifying the origin, source or programme of the tags on a North Atlantic basin-wide scale. This is needed to facilitate identification of individual tagged fish taken in marine fisheries or surveys. Data on individual PIT tags used in Norway has now been compiled, but an ICES coordinated database, where the data could be stored, is needed.
2. The Working Group recommends complete and timely reporting of catch statistics from all fisheries for all areas of eastern Canada.
3. The Working Group recommends improved catch statistics and sampling of the Labrador and Saint Pierre and Miquelon fisheries. Improved catch statistics and sampling of all aspects of the fishery across the fishing season will improve the information on biological characteristics and stock origin of salmon harvested in these mixed-stock fisheries.
4. The Working Group recommends that additional monitoring be considered in Labrador to estimate stock status for that region. Additionally, efforts should be undertaken to evaluate the utility of other available data sources (e.g. Indigenous and recreational catches and effort) to describe stock status in Labrador.
5. The Working Group recommends that the Government of Greenland continue efforts to improve the reporting system of catch in the Greenland fishery and that detailed statistics related to spatially and temporally explicit catch and effort data for all fishers be made available to the Working Group for analysis.
6. The Working Group recommends that consideration be given to expanding the West Greenland sampling programme to provide improved spatial and temporal coverage to more accurately estimate continent and region of origin and biological characteristics of the mixed-stock fishery.
7. The Working Group recommends conducting a modelling workshop with jurisdictional experts of the WGNAS ahead of the 2021 WGNAS meeting. The workshop would formalise the workflow of the proposed life cycle modelling framework and include training for participants. WGNAS would then provide a comparison of the current and new modelling method used for multiple year catch advice in their 2021 report. This exercise is necessary prior to fully considering the life cycle model as an improved and alternate approach.

Annex 8: ICES WGNAS Data call review

8.1 Data submitted to ICES

Data were sent to ICES and the files were collated and provided in a directory on the Expert Group SharePoint site.

Filename format was not respected in all cases and some of this may be due to unclear directives in the Data Call note. The instructions with the Data Call indicated that the filename format for the 2019 data (2020 Data Call) was to be:

2020_*expertgroup_ICES stock code_country*

with:

- Expert group = WGNAS
- ICES stock code = either sal.nac.all (for North America Commission), sal.neac.all (for Northeast Atlantic Commission), sal.wgc.all (for West Greenland Commission)
- Country as defined in the spreadsheet schema.

Data files were requested to be submitted as CSV file formats. Most of the data files were in comma delimited (.csv) format but several submissions were in an alternate format (semi-colon), a few were in .xlsx format, and one was in .txt format. All files were readable and the data could be resolved with simple conversions in Excel.

Data Call submissions with revised file names and in csv format are on the WGNAS SharePoint site (WGNAS Accessions / Data call 2020 / revised files March 2020 /).

Data Call template schema

The Data Call provided a template schema (Excel spreadsheet) with pre-defined columns and descriptions of data fields and codes for several of the data fields.

The Working Group was informed of an initiative by ICES to develop structured databases for data used by Expert Groups. The initiative, the Regional Database and Estimation System (RDBES), has developed a database structure and schema focused on commercial sampling data, which would not easily apply to salmon catch data in North Atlantic (see Section 2.6). As stated by ICES, RDBES does not currently support recreational catch data. However, data standards are essential and there may be schema structures currently within RDBES that could be applied to the Atlantic Salmon Data Call and database format.

Geographic area descriptors

The Atlantic Salmon Data Call schema currently has a hierarchical structure to define the stock units according to:

1. Commission: defined as the NASCO Commissions (NAC, NEAC, WGC)
    - 1.1 Major Stock Unit: defined as countries or jurisdictions
        - 1.1.1 Minor Stock Unit: not prescribed
            - 1.1.1.1 River_Name: not prescribed

NASCO requires parties to report catches at the scale of Commission and Major Stock Unit as defined in the schema.

NASCO also requests estimates of worldwide aquaculture production of Atlantic salmon. A Major Stock Unit category (exNA) to describe activities outside the North Atlantic is proposed to be added.

The catch data are also used in the run reconstruction, stock status, and the development of catch advice by the Working Group. Consideration could be made to compiling the catch data using a "Minor Stock Unit" category that corresponds to the stock units used in the North Atlantic wide Life Cycle Model; six stock units in NAC, seven stock units for southern NEAC, and eleven stock units for northern NEAC.

Time period

The data were requested for the previous calendar year (1 January to 31 December 2019).

A YEAR column is required to accommodate cases where availability of data lags by one year; for example, aquaculture production for Canada reported in the 2020 Data Call is actually data for the 2018 production year. As well, since some of the data provided are provisional, the expectation would be that the database from previous year(s) would be updated with final values when these become available.

Exclusion of subtotals

Each row of the database should represent unique data, i.e. no subtotals. To do so, a code that indicates non-specification (NS) of variable categories is required. For example, catches in the recreational fishery may be reported for an individual river within a Minor Stock Unit Area and in a separate row catches in the recreational fishery from all other rivers within that Minor Stock Unit Area would be reported under the River_Name coded NS. Similar NS codes would be required for F_AREA (fishing location), SEA_AGE/size_class, and FATE (REPO, UNRE).

Fishery descriptors (F_TYPE)

The current descriptors and categories of fishery type need revision. Specifically, the current category ABOR (Aboriginal) is not sufficient to describe fishing other than in REC, COM, RAN. The following changes are proposed:

- INDG: should be used to report on catches from Indigenous communities (rather than ABOR for Aboriginal).
- SUBS: should be used to report on licenced fishery catches by non-Indigenous peoples that are used for food, as separate authority from REC, COM, and INDG. Examples include the food fishery for residents (non-Indigenous) of Labrador (Canada) and the private fishery in Greenland (currently private and professional (i.e. COM) catches are identified as ABOR in the 2020 Greenland submission).

Ranching (F_TYPE = RAN) has been defined by ICES as:

"the production of salmon through smolt releases with the intent of harvesting the total population that returns to freshwater (harvesting can include fish collected for broodstock) (ICES, 1994)."

- Ranching with the specific intention of harvesting by rod fisheries has been practised in two Icelandic rivers since 1990, and these data are included in the ranched catch. A similar approach has been adopted for one river in Sweden (River Lagan) where hatchery origin smolts are released under programmes to mitigate for hydropower development schemes with no possibility of spawning naturally in the wild. In Ireland, ranching is currently only carried out in two salmon rivers under limited experimental conditions. A catch from one river in Denmark is believed to be mostly fish of ranched origin. No estimate of ranched salmon production was made in UK (N. Ireland) where the proportion of ranched fish was not assessed between 2008 and 2018 due to a lack of CWT returns.

- There is currently a duplication / redundancy for Iceland and Sweden. For these countries, there is a Major Stock Unit code corresponding to wild salmon (ISW, SEW) or ranched salmon (ISR, SER). As F_TYPE has a category for ranched fish, the Major_Stock_Unit for these countries should be simplified to IS (Iceland) and SE (Sweden).

Catch Data

Catch data fields (Catch_number of individuals; Catch_weight in Kg) are intended to be numeric, but as presently described they can contain numeric and character entries. It is recommended that these data fields be exclusively numeric.

Clarification is required regarding the units to be used for fishery catches (kg) versus aquaculture production (requested as either kg or tonnes). As aquaculture production is very large compared to fisheries catches, FARM catch weight would be reported in tonnes and fisheries catch weight (F_TYPE ≠ FARM) would be reported in kg.

Catch numbers should be rounded to whole fish, catch weights should be rounded to whole kg or tonnes (for F_TYPE = FARM).

Zero catch would be entered as null (0).

Empty cells would be used for missing values. Reasons for missing values are provided in a new column (DATA_QUALITY) (see next section).

Missing data descriptors

Not all catch data, in number or weight, can be reported. An explanation for missing data for catch weight or catch number (empty cells) would be provided using codes in a new variable called "DATA_QUALITY". The codes are those currently defined for the 2020 Data Call spreadsheet.

DATA_QUALITY	
NR	Not reported: data or activity exist but numbers are not reported to authorities (for example for commercial confidentiality reasons).
ND	No data: where there are insufficient data to estimate a derived parameter.
NC	Not collected: activity / habitat exists but data are not collected by authorities (for example where a fishery exists, but the catch data are not collected at the relevant level or at all).
NP	Not Pertinent: where the question asked does not apply to the individual case (for example where catch data are absent, as there is no fishery or where a habitat type does not exist).

When no Atlantic salmon fishery is authorised

At present, fisheries that are closed can be identified using the DATA_QUALITY field (code = NP). To be complete, each submission would minimally contain one row for each F_TYPE (REC, COM, RAN, FARM, INDG, SUBS). If any of these activities do not occur because they are not authorised, the catch data fields would be blank, the DATA_QUALITY field would be coded NP, and data fields for F_AREA, SEA_AGE/size class, FATE, and Reporting_class would all be coded NS (non-specific).

8.2 Proposed changes to database schema and data entry

Several changes were made to the data entry template.

- Two variables were added to the template:
  - YEAR – to identify the year for the data provided;
  - DATA_QUALITY – to characterize the reasons when no catch data (in number, in weight, or both) are provided. The data quality variable was in the previous template, but the codes could be used for a number of variables.
- Some columns were re-ordered to improve the flow.
- Catch data (as number or weight) are now restricted to numeric values >= 0.
- A generic code (NS) is provided for several data fields for when no specific information is available.
- The code "ALL" which was previously proposed when categories of age/size class or fishing location were not specified has been removed.
- Each row is expected to be a unique entry in the template, subtotals of catches should not be used.
- Each submission would minimally contain one row for each of the fishery components (REC, COM, RAN, FARM, INDG, SUBS). If any of these activities do not occur because they are not authorised, the catch data fields would be blank, and the DATA_QUALITY field would be coded NP (Not Pertinent), signifying that catch data are absent because there is no fishery.
- To reduce data entry errors and the minimize the use of non-standard codes, drop-down lists for categorical variables were added to the data call template proposed for the 2021 call
  (WGNAS_2021_Annex1 revised version with drop down lists etc.xlsx).

8.3 Quality control / quality assurance

All countries/jurisdictions in the North Atlantic are expected to respond to the Data Call request from ICES. The date for response, late March, should be sufficient. An earlier request date could not be accommodated by all jurisdictions. For most jurisdictions, the data provided are provisional.

The Working Group would review the Data Call submissions and provide feedback to contributors. Revised Data Call submissions would be provided to ICES by the Working Group by the close of the Working Group meeting.

ICES will maintain the Data Call submissions for each year on the Working Group SharePoint site.

If countries need to resubmit data from previous years, they need only submit data for that year. ICES will provide the most current data sheet to a requesting party to which revisions could be made and returned to ICES.

8.4 DRAFT Data call for ICES selected stocks under WGNAS 2021

1. Scope of the Data call

ICES Member Countries are requested to provide the following for salmon (*Salmo salar*) in the North Atlantic:

- Final data on salmon catches and landings by country and by fisheries, including unreported catches, and catch and release in 2019;
- Final data on production of farmed and ranched Atlantic salmon in 2019;
- Provisional/final data on salmon catches and landings by country and by fisheries, including unreported catches, and catch and release in 2020; and
- Provisional/final data on production of farmed and ranched Atlantic salmon in 2020;
- Fisheries to be reported on include:
  - Commercial fisheries,
  - Recreational fisheries,
  - Indigenous Peoples fisheries, and
  - Subsistence (food) fisheries, by non-Indigenous peoples.

2. Rationale

The data requested will be used by the Working Group on North Atlantic Salmon (WGNAS), which is involved in the provision of ICES advice on fishing opportunities for salmon in the Atlantic.

3. Legal framework

The legal framework for the data call is as follows:

Article 15 of the NASCO Convention, with reference to obligations of Parties to provide to the Council the available catch statistics, other statistics, and any other available scientific information that the Council requires for the purposes of the Convention.

Regulation (EU) No 2017/1004 on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

Commission Implementing Decision (EU) 2016/1251 of 12 July 2016 adopting a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017–2019.

Regulation (EU) No 1380/2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009.

This data call also follows the principles of personal data protection as referred to in paragraph (9) of the preamble in Regulation (EU) 2017/1004 and repealing Council Regulation (EC) No 199/2008.

4. Deadlines

ICES requests that the data be delivered by the 15 March 2021, to provide enough time for additional quality assurance prior to the launch of analyses and the working group meeting.

5. Data to report

5.1 Geographic and temporal scope

Data on landings (Section 5.2.) should be reported by Country, Major Stock Unit for the calendar year 2020. Revised / finalized data should be reported for 2019 and in any previous year where relevant. Data for 2020 can be marked as provisional, where necessary. The geographical scope is the North Atlantic and the species of interest is Atlantic salmon (*Salmo salar*).

5.2 Data types

Data on catches and landings are to be reported for the following relevant fishery activities:

- Commercial fisheries,
- Recreational fisheries,
- Indigenous Peoples fisheries,
- Subsistence (food) fisheries, by non-Indigenous peoples.

For each of the above, the following data are requested:

- Landings (in numbers and kg round fresh weight) by Country, sea age/size class (sea winters or small vs large salmon), catch location (coastal, estuarine, riverine) and as reported or unreported.
- Fish released back alive (in number) by Country.

In addition, annual production of ranched (in number and kg) and farmed Atlantic salmon (in number and tonnes) by country is to be provided.

5.3 Data revisions

If countries need to resubmit data from previous years, they need only submit data for that year. ICES will provide the most current data sheet to a requesting party to which revisions could be made and returned to ICES.

6. Data submission

Data should be submitted to data.call@ices.dk using the spreadsheet template (Table 8.1). The template contains descriptions of codes to be used and drop-down lists with some examples. Data should be submitted as a comma-separated CSV file.

Both email subject and file name must include year, working group, ICES stock code and country references.

- For example, "2021_WGNAS_sal.neac.all_RU.csv" for data inputs from Russia for 2020.

ICES Stock Code	FAO Code	ICES Stock Description
sal.nac.all	SAL	Salmon (*Salmo salar*) from North America
sal.neac.all	SAL	Salmon (*Salmo salar)* in Northeast Atlantic and Arctic Ocean
sal.wgc.all	SAL	Salmon (*Salmo salar*) in Subarea 14 and NAFO division 1 (east and west of Greenland)

7. Contact information
For support concerning details on data deliveries, contact WGNAS chair Dennis Ensing (Dennis.Ensing@afbini.gov.uk) and WGNAS Expert Group Data Call representative Alan Walker (alan.walker@cefas.co.uk).

For support concerning any data call issues, please contact the Advisory Department (Advice@ices.dk).

For support concerning other data-submission issues, please contact: data.call@ices.dk

Table 8.1. ICES WGNAS data call spreadsheet template.

Field name	Description	Guidance	Data type	Date entry
YEAR	Year corresponding to the data	As defined by data provider	numeric	User entered
COUNTRY	Country reporting the catch	See Vocabulary tab for codes	character	Drop-down list
SPECIES	SAR - Atlantic salmon, *Salmo salar*	See Vocabulary tab for codes	character	Drop-down list
F_TYPE	Type of fishery (Commercial, Recreational, Farmed, Ranched, Indigenous, Subsistence(food))	See Vocabulary tab for codes	character	Drop-down list
F_AREA	Fishing area (river, estuary, coastal, not-specified)	See Vocabulary tab for codes	character	Drop-down list
Catch_number	Number of individuals caught from fisheries or produced from aquaculture or sea ranching activities, if no data leave blank	Number rounded to whole fish	numeric	User entered, error checking (>=0)
Catch_weight	The round weight of catch (kg) or aquaculture production (tonnes), if no data leave blank	Weight rounded to whole kg or whole tonne	numeric	User entered, error checking (>=0)
DATA_QUALITY	Codes for describing empty cells for catch data	See Vocabulary tab for codes	character	Drop-down list
COMMISSION	NASCO Commission Area (North American Commission, West Greenland Commission, North-East Atlantic Commission, outside North Atlantic) where fish were caught	See Vocabulary tab for codes	character	Drop-down list
MAJOR_STOCK_UNIT	Country or jurisdiction	See Vocabulary tab for codes	character	Drop-down list
Minor Stock Unit	Sub jurisdiction scale	As defined by data provider	character	User entered
River name	Name of river if F_AREA = R, and river specific data are available, include the river name here. In all other cases, record "NS".	As defined by data provider	character	User entered

SEA_AGE_SIZE_CLASS	Age or size class of catch	See Vocabulary tab for codes	character	Drop-down list
FATE	Fate of the catch as retained, released, not-specified	See Vocabulary tab for codes	character	Drop-down list
REPORTING_CLASS	Reported and unreported catch categories are recorded here	See Vocabulary tab for codes	character	Drop-down list
DATA_TYPE	Final and provisional data indicated here	See Vocabulary tab for codes	character	Drop-down list
Harvest rate changes	Insert text to explain these harvest rate changes in the same rows as appropriate catches.	As defined by data provider	character	User entered
Comments	Insert other comments here.	As defined by data provider	character	User entered

Annex 9: Draft resolution for Life-cycle Modelling Workshop

Chair Etienne Rivot (Agrocampus Ouest, France), and TBD (North America)

Location Rennes (France) or Copenhagen (DK) (location to be confirmed)

Date December 2020 or early January 2021 (to be confirmed)

People attending Jurisdiction experts and modellers of the ICES WGNAS

Life cycle model expert: Maxime Olmos (Agrocampus Ouest, France) (to be con firmed)

Context

The WGNAS has developed run reconstruction (PFA) and forecast models of abundance of Atlantic salmon at the stock complex (North America; South Northeast Atlantic, North Northeast Atlantic) and regional scales (for six regions in North America; for eight jurisdictions in Southern NEAC; for seven jurisdictions in Northern NEAC) for the provision of catch advice for NASCO and to better understand population dynamics. A new Bayesian Life-cycle model has been proposed to improve the biological realism, and to advance exploration of factors that are driving salmon abundance. The Life-cycle model development is being led by Etienne Rivot and Maxime Olmos (Agrocampus Ouest) using data provided by members of the WGNAS.

Following discussions at the WGNAS 2020, and in preparation for a future Benchmark, and the application of the Life-cycle model by the Working Group for the assessment and multiyear catch advice, a workshop of jurisdictional experts and modellers to develop competencies in using the Life-cycle Model and to formalize the workflow of the new modelling framework is recommended to take place in late 2020 or the latest January 2021.

The objectives of the workshop would be:

i. To train members of the WGNAS in the use of the Life-cycle model which is currently coded in R and NIMBLE (https://r-nimble.org/);
ii. To improve and formalize the workflow from data preparation/updating to the production of multiple year catch advice;
iii. To finalize a working paper and/or manuscript comparing outputs of the PFA models and the Life-cycle model; and to prepare documentation on the model.

Expected outputs from the workshop

- It will contribute to build a shared vision among the WGNAS expert group of the new methodological framework used for providing catch advice based on the life-cycle model.
- A Working paper describing the Bayesian Life-cycle Model and its application to the development of multiyear catch advice to be presented at the ICES WGNAS meeting in late March 2021.
- Working papers describing data inputs, workflow and for the Bayesian Life-cycle Model to be presented at the upcoming ICES WGNAS meeting in late March 2021.