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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 2020 was 915 t. This was 30 t above the updated catch for 2019 (885 t) but 197 and 346 t below the previous five- and ten-year means, respectively.
- The provisional estimate of farmed Atlantic salmon production in the North Atlantic area for 2020 is 1821 kt, which is an increase on the production for 2019 (1771 kt) and the previous five-year mean (1627 kt). The production of farmed Atlantic salmon in this area has been over one million tonnes since 2009. The total worldwide production in 2020 is provisionally estimated at around 2638 kt which was almost 3000 times the catch of wild Atlantic salmon.
- The provisional nominal catch in the NEAC area in 2020 (778 t) was slightly higher than the updated catch for 2019 (755 t) and 19% and 29% below the previous five-year and ten-year means, respectively.
- The Working Group reported on the findings of a study on the performance of fishery sampling programmes to estimate catches of low-proportions of non-local origin salmon in mixed-stock fisheries and on a catchment-wide international coordinated genetic monitoring programme of reintroduced Atlantic salmon on the River Rhine.
- A number of threats were discussed including diseases and parasite events in Ireland (Red Skin Disease) and UK (Northern Ireland) (river lamprey), and exotic salmonids (pink salmon) in northern Finland.
- The Working Group received an update on the progress of the development of the new Bayesian Life Cycle Model (LCM) that has been proposed to improve the biological realism of the stock assessment model used by WGNAS. A workshop (WKSalModel) to advance this process convened in January 2021 to familiarise experts with the methodological framework used for providing catch advice based on the LSM, and to discuss and formalise the workflow. Finally, next steps and timelines for data inputs for the use of the LSM in the proposed 2022 WGNAS Benchmark were discussed.
- The impact of the coronavirus (COVID-19) pandemic was not consistent among jurisdictions with respect to Atlantic salmon fisheries and ICES WGNAS participants' ability to report 2020 Atlantic salmon catches and status of stocks. There was little or no impact reported for UK (Northern Ireland), Ireland, Iceland, Norway, Sweden and Denmark. In other jurisdictions, stay-at-home orders and travel restrictions affected fishing effort,

Atlantic salmon population monitoring activities and delayed the collection of fisheries statistics.

- 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 were also considered to be at full reproductive capacity in the latest PFA year, although this is due, at least in part, to changes in the UK (Northern Ireland) and UK (Scotland) SERs and CLs.
- Catch advice for the Faroes fishery was developed for the 2021/2022 to 2023/2024 fishing seasons. In the Northern NEAC stock complex, over the forecast period, the non-maturing 1SW component has a high probability (≥95%) of achieving its SER for TACs at Faroes solely for a catch option of ≤20 t in the 2021/2022 season. The maturing 1SW component in the Northern NEAC stock complex and both Southern NEAC stock complex components each have less than 95% probability of achieving their SERs with any TAC option in any of the forecast seasons. Therefore, there are no catch options that ensure a greater than 95% probability of each stock complex achieving its SER.
- The probabilities of the non-maturing 1SW national management units achieving their SERs in 2021/2022 vary between 20% (UK, Northern Ireland) and 99% (Norway) with zero catch allocated for the Faroes fishery and decline with increasing TAC options. The only countries to have a greater than 95% probability of achieving their SERs with catch options for Faroes are Norway (TACs ≤40 t) and UK (England & Wales) (TACs ≤40 t). In most countries, these probabilities are lower in the subsequent two seasons. There are, therefore, no TAC options at which all management units would have a greater than 95% probability of achieving their SERs.
- In the NAC area, the 2020 provisional harvest in Canada was 104 t, approximately 4% higher than the finalised 2019 harvest of 100 t and the third 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 20 rivers in Québec.
- In 2020, 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 31.7 t was reported for 2020 compared to 29.8 t in 2019. Data on continent or region of origin were not available for 2020 due to a lack of available samples.
- At West Greenland there are no mixed-stock fishery catch options for 2021, 2022, or 2023 that would be consistent with a chance of 75% or greater of simultaneously attaining management objectives for the seven stock complexes.
- The two Indicator Frameworks developed previously by the Working Group to be used to check on the status of the NAC and NEAC stocks in the interim years of the multiannual catch advice cycle were updated and are available to be used any new multi-year agreements for the fisheries at Greenland and the Faroes, respectively.

ii Expert group information

Expert group name	Working Group on North Atlantic Salmon (WGNAS)
Expert group cycle	Annual
Year cycle started	2021
Reporting year in cycle	1/1
Chair	Dennis Ensing, Northern Ireland, UK
Meeting venue and dates	22–31 March 2021, Online meeting (34 participants)

1 Introduction

1.1 Main tasks

At its 2020 Statutory Meeting, ICES resolved C. Res. **2020**/2/FRSG18 that the **Working Group on North Atlantic Salmon** [WGNAS] (chaired by Dennis Ensing, UK) will meet at the ICES Secretariat 22–31 March 2021. 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 met.

The sections of the report which provide the answers to the questions posed by NASCO, are identified below:

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 2020[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]	2.3
1.3	provide a compilation of tag releases by country in 2020;	2.7
1.4	identify relevant data deficiencies, monitoring needs and research requirements;	Annex 7
1.5	review and update the General Considerations section (Annex 2) of the ICES Commissions' advice documents to include 'Environmental and other influences on the stock'.	Annex 2 Advice Document
2	**With respect to Atlantic salmon in the Northeast Atlantic Commission area:**	Section 3
2.1	describe the key events of the 2020 fisheries[2];	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
2.4	provide catch options or alternative management advice for the 2021 / 2022 – 2023 / 2024 fishing seasons, with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding[4]; and	3.5
2.5	update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.	3.6

Question		Section
3	**With respect to Atlantic salmon in the North American Commission area:**	Section 4
3.1	describe the key events of the 2020 fisheries (including the fishery at Saint Pierre and Miquelon)[2];	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
3.4	provide catch options or alternative management advice for 2021 – 2024 with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding[4] ; and	4.4
3.5	update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.	4.5
4	**With respect to Atlantic salmon in the West Greenland Commission area:**	Section 5
4.1	describe the key events of the 2020 fisheries[2]; and	5.1
4.2	describe the status of the stocks[3].	5.3
4.3	provide catch options or alternative management advice for 2021 – 2023 with an assessment of risk relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding[4] ; and	5.4, 5.8
4.4	update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.	5.9

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 (Section 2.1.1). Numbers of salmon caught and released in recreational fisheries should be provided (Section 2.1.2).

[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 (Sections 2.3.2-2.3.6).

[3]In the responses to questions 2.1 (Section 3.1), 3.1 (Section 4.1) and 4.1 (Section 5.1), 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 surveys are conducted and reported to ICES, ICES should review the results and advise on the appropriateness for incorporating resulting estimates into the assessment process).

[4]In response to questions 2.4, 3.4 and 4.3, provide a detailed explanation and critical examination of any changes to the models used to provide catch advice and report on any developments in relation to incorporating environmental variables in these models (Sections 3.5, 3.6, 4.4, 4.5, 5.8). Also provide a detailed explanation and critical examination of any concerns with salmon data collected in 2020 which may affect the catch advice considering the restrictions on data collection programmes and fisheries due to the Covid-19 pandemic (Section 2.3.1).

[5]In response to question 4.2, ICES is requested to provide a brief summary of the status of North American (Section 5.3.1) and North-East Atlantic (Section 5.3.2) 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 32 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
Julien April	Canada
Hlynur Bardarson	Iceland
Ida Ahlbeck Bergendahl	Sweden
Geir H. Bolstad	Norway
Cindy Breau	Canada
Mathieu Buoro	France
Karin Camara	Germany
Gérald Chaput	Canada
Anne Cooper	Denmark (ICES)
Guillaume Dauphin	Canada
Dennis Ensing Chair	UK (Northern Ireland)
Jaakko Erkinaro	Finland
Peder Fiske	Norway
Marko Freese	Germany
Jonathan Gillson	UK (England & Wales)
Stephen Gregory	UK (England & Wales)
Nora Hanson	UK (Scotland)
Niels Jepsen	Denmark
Nicholas Kelly	Canada
Wendy Kenyon Observer	UK (NASCO)
Hugo Maxwell	Ireland
David Meerburg	Canada

Member	Country
Michael Millane	Ireland
Rasmus Nygaard	Greenland
James Ounsley	UK (Scotland)
Rémi Patin	France
Sergey Prusov	Russian Federation
Dustin Raab	Canada
Etienne Rivot	France
Martha Robertson	Canada
Timothy Sheehan	USA
Ross Tallman	Canada
Alan Walker	UK (England & Wales)
Vidar Wennevik	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, and reported. Total nominal catches of salmon reported by country in all fisheries for 1960–2020 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 2020 (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 2020 was 915 t, 30 t above the updated catch for 2019 (885 t) but 197 and 346 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 2020) in Finland, UK (England & Wales) and UK (Northern Ireland) (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 2020 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 have been no coastal fisheries in Iceland, Spain, or Denmark throughout the time series. 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 2016, or in the UK (England & Wales) since 2019 (England) and 2020 (Wales). In most countries in recent years, the majority of the catch has been taken in rivers and estuaries.

Coastal, estuarine and in-river catch data for the period 2009 to 2020 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 231 t in 2020, and in-river catches have declined from 594 t in 2009 and 454 t in 2020. 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 have been no coastal catches since 2019. Estuarine fisheries have also declined, from 48 t in 2007 to 23 t in 2020. 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 2020, about one quarter of the catch was from estuarine fisheries and three quarters from in-river fisheries.

In North America, the total catch has been fluctuating between 80 and 182 t over the period 2009 to 2020. Around two thirds of the total catch in this area has been taken by in-river fisheries, although it was about half since 2018. 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, and has since fluctuated between 28 and 40 t. A small number of salmon have been caught in the estuary near the Kapisillit River (in 2019, 19 salmon, total weight 81 kg; in 2020 no catch reported). Genetic studies have shown this river stock is very isolated from other stocks in the North Atlantic but is an outgroup of the NEAC phylogenetic group, and salmon caught in the estuary were exclusively from the Kapisillit River (Krohn 2013 unpublished; Arnekleiv *et al*., 2019).

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 2020 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 2020 this ranged from 16% in Sweden, to 93% in UK (England & Wales) 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 196 000 salmon were reported to have been released from rod fisheries around the North Atlantic in 2020, 6% above the previous five-year mean (around 185 000).

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.

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 2020) 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 catches for Canada for 2009, 2010 and 2019 were 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 2020 was estimated to be 276 t. The unreported catch in the NEAC area in 2020 was estimated at 239 t, and those for West Greenland and the NAC area at 10 t and 27 t, respectively. The 2020 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 2020 is 1821 kt, which is an increase on the production for 2019 (1771 kt) and the previous five-year mean (1627 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 (77% 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) – no data were reported for 2020. Farmed salmon production in 2020 was above the previous five-year mean in all countries with the exception of Ireland. Data for UK (Northern 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 2018 data from the FAO Fisheries and Aquaculture Department database for some countries in deriving a worldwide estimate for 2020. The total worldwide production in 2020 is provisionally estimated at around 2638 kt (Table 2.2.1.1 and Figure 2.2.1.1), which is higher than in 2019 (2583 kt) and the previous five-year mean (2394 kt). Production of farmed Atlantic salmon outside the North Atlantic is estimated to have accounted for one third of the worldwide total in 2020 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 2020 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 2020, a catch of 524 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 2020 was 39 t (Iceland, Ireland and Sweden; Table 2.2.2.1; Figure 2.2.2.1) with the majority of catch taken in Iceland (28 t). The total harvest was 11% above the previous five-year mean (35 t). No estimate of ranched salmon production was made in UK (Northern Ireland) where the proportion of ranched fish was not assessed between 2008 and 2020 due to a lack of coded-wire-tag (CWT; microtags) returns.

2.3 NASCO has asked ICES to report on significant, new or emerging threats to, or opportunities for, salmon conservation and management

This section answers question 1.2 of the ToRs, providing updates with regard to understanding of diseases and parasites, lamprey predation on smolts, performance of fishery sampling program(me)s, pink salmon, and studies relating to the reintroductions of Atlantic salmon in the River Rhine.

The WGNAS did not review any recent information on research into the migration and distribution of salmon at sea, or the potential implications of climate change for salmon management.

2.3.1 Impacts of COVID-19

The impact of the coronavirus (COVID-19) pandemic was not consistent among jurisdictions with respect to Atlantic salmon fisheries and ICES WGNAS participants' ability to report 2020 Atlantic salmon catches and status of stocks. There was little or no impact reported for UK (Northern Ireland), Ireland, Iceland, Norway, Sweden and Denmark. In other jurisdictions, stay-at-home orders and travel restrictions affected fishing effort, Atlantic salmon population monitoring activities and delayed the collection of fisheries statistics. Specific details are provided within relevant sections (3, 4, 5) where appropriate. Notable impacts by jurisdiction were generally outlined as follows:

- NEAC
  - France
    - Recreational fishing was not permitted under stay-at-home orders, however professional fishing was not restricted.
    - Population monitoring activities were not, or only partially, operational during the spring which would affect the estimate of smolt abundance and MSW returns.
  - UK (England & Wales)
    - Recreational fishing was restricted under stay-at-home orders for some months of the rod angling season (March to June in England, and March to July in Wales).
    - Commercial fishing was not restricted.
    - Most adult salmon monitoring activities were conducted as usual, but no juvenile monitoring was possible.
  - UK (Scotland)
    - Recreational fishing was restricted under stay-at-home orders for some months of the rod angling season (March, April, May, June and November). This resulted in reduced fishing effort and catch compared to previous years.
    - River-specific abundance estimates for Scotland are mainly derived from monthly reported rod catches. To mitigate against an underestimate of abundance as a result of COVID-19-reduced effort, an 'expected-catch' was estimated for the relevant months. These expected-catch estimates were used as the input in the abundance modelling process.

        - Collection of fishery statistics were delayed but were collated in time for ICES WGNAS. These data had not yet been published by the Scottish Government (expected 26 May). As an interim measure, 2019 catch statistics were provided for publication in the ICES WGNAS report. However, the 2020 data were used for stock assessment analyses within the run-reconstruction PFA and forecast models.
- NAC
    - Quebec
        - Total numbers of recreational fishing days were similar to previous years. However, effort increased in the south and decreased in the north where outfitting camps were closed due to COVID-19 restrictions.
        - Total number of licences sold was also similar to previous years. However, there was a record high number of resident licences sold and a record low for non-resident licences (85% less than the previous five year mean).
        - Population monitoring activities were not affected.
    - Maritimes
        - Population monitoring activities were limited and the status of some stocks could not be reported to ICES WGNAS.
    - Gulf
        - Population monitoring was affected. There was no smolt monitoring and several adult monitoring activities were not operated.
    - Newfoundland and Labrador
        - Population monitoring activities were affected. There was no smolt monitoring and many adult monitoring activities were delayed or not operated.
        - 2020 recreational catch data were not available for ICES WGNAS due to delays in data collection and synthesis. 2019 recreational catch data were used as the 2020 provisional catch.
    - USA
        - Population monitoring activities were affected. There was no smolt monitoring but adult monitoring was unaffected.
- West Greenland Sampling Programme
    - The International Sampling Programme was significantly impacted by the COVID-19 pandemic. Given travel restrictions associated with the pandemic, international samplers were unable to travel to Greenland to collect biological characteristics data, scale samples for age determination and tissue samples for genetic origin analyses. These data are important inputs to account for fishery removals within the NAC and NEAC assessment models. A Contingency Sampling Programme was implemented as an alternate approach that relied on domestic efforts to collect the required samples and data (see Section 5.2). Delays in domestic shipping within Greenland affected the delivery of sampling kits to the Municipality Offices and office closures limited the ability of individual fishers to obtain kits. These factors resulted in a small number of samples being collected. Samples collected in 2020 were not received in time to be processed for the ICES WGNAS meeting but will be processed and made available in 2022.

2.3.2 Diseases and Parasites

2.3.2.1 Project for Nordic cooperation on salmon health

The Working Group reviewed reports of further disease outbreaks in Nordic countries, in the Atlantic Ocean as well as in the Baltic Sea. The health problems, with clinical signs like haemorrhage, erosions, and ulcerative/necrotic skin conditions in returning adults, were recently defined as the Red Skin Disease (RSD, Weichert *et al.*, 2021). However, the cause for RSD is still unknown.

The Fisheries Co-operation of the Nordic Council of Ministers, funded a new project regarding salmon health that was initiated in January 2021. To facilitate the exchange of expertise and infrastructure and highlight the collaborative possibilities across the Nordic countries, this project includes networking activities and a joint research study. In the study, the associations between gene expression and pathology with regards to RSD will be investigated. In addition, biomarkers will be developed that are suitable for non-lethal sampling and potential monitoring of RSD.

Sampling for this study will take place during the spring/summer of 2021 in seven rivers in Sweden, Finland, Norway, and Denmark, where fish with RSD symptoms have been observed. Sampling will also be conducted in one Norwegian river without reports of RSD. From each river, the aim is to collect ten sick and ten healthy fish for pathological studies as well as gene expression and biomarkers.

Researchers presented the project plans to the WGNAS and got valuable feedback and relevant contact information to expand the network and potential scope of the study. Please contact Elin Dahlgren (elin.dahlgren@slu.se) or Lo Persson (lo.persson@slu.se) at the Swedish University of Agricultural Sciences (SLU), Sweden, for involvement and/or further information regarding this project.

2.3.2.2 Update on Red Skin Disease

Various surveillance programmes and awareness-raising campaigns for reporting of RSD have been established or continued in 2020. As in 2019, several European countries reported Atlantic salmon returning to rivers with RSD in 2020 during late spring into summer. While the majority of recorded cases in Ireland are observed in 1SW salmon, this is not the case elsewhere in Europe (notably UK (Scotland) and northern European countries) where RSD is principally observed in MSW stocks. This may be a consequence of the Irish stocks being predominantly 1SW. RSD was not reported in Greenland, Canada or the USA.

2.3.3 Lamprey effects on Atlantic salmon smolts

In 2020, a study on smolts in the River Lower Bann in UK (Northern Ireland) by Kennedy *et al.* (2020) showed a high number of smolts damaged by river lamprey (*Lampetra fluviatilis*). This anadromous lamprey species has a landlocked form endemic to Lough Neagh, the large lake in the River Bann system. It is known that these lamprey parasitise on the trout (*S. trutta*) and pollan (*Coregonus pollan*) stocks in Lough Neagh. Parasitisation on salmon smolts had not been observed before, even though it was expected to occur at low levels. What was unique about the observation made in 2020 was the high number of smolts affected, with an estimated 24% (of 470 smolts) heavily damaged making survival in the marine phase extremely unlikely. This is expected to have a strong negative effect on adult salmon recruitment in 2021 (1SW) and 2022 (2SW) for rivers flowing into Lough Neagh.

The causes of this are probably associated with the low flows during the smolt migration which held up smolts in Lough Neagh, restricting migration through the River Lower Bann towards the sea. This large aggregation of smolts in the northern part of the lough probably attracted lampreys in large numbers, causing the large number of smolts with lamprey damage.

2.3.4 Performance of fishery sampling programmes to estimate catches of low proportions of non-local origin salmon in mixed-stock fisheries

Fisheries for Atlantic salmon that occur at sea, along the coast, and in some cases in estuaries, have the potential to exploit salmon of non-local origin. In eastern Canada, subsistence fisheries by Indigenous peoples and Labrador residents using gillnets are presently conducted close to the communities, in deep bays and along the coast away from the headlands, and interception of non-local stocks of salmon remains an issue. Particular concern has been expressed regarding the interception of USA origin salmon in the Labrador fisheries because of the low abundance and endangered population status of salmon in the eastern USA. The detection of USA origin salmon in the samples from the Labrador fishery is a rare event. Genetic analyses of samples using microsatellites initially, and Single Nucleotide Polymorphism (SNPs) since 2017, have assigned a total of six out of more than 6000 samples to the USA reporting group over the 14 years of sampling, 2006 to 2020.

ICES (2020) had commented on the lower sampling rates (% of catch sampled) for the Labrador subsistence fishery (4% of 12 858 fish in 2019) compared to the efforts in the West Greenland (11% of 9800 fish in 2019) and the Saint Pierre and Miquelon (13% of 509 fish in 2019) fisheries and recommended improved catch statistics and sampling of all aspects of the fisheries across the fishing season to improve the information on biological characteristics and stock origin of salmon harvested in these mixed-stock fisheries.

The performance of sampling programmes was examined by simulation of catches, varying proportions of non-local origin salmon, and varying sampling rates. Bias (estimated catch relative to true catch) and precision (coefficient of variation) are described. Only two types (local, non-local) of fish in the fishery were considered with the non-local origin group comprising very low proportions of the total pool of fish available to harvest, as is assumed the case for USA origin salmon in the Labrador fishery.

Fishery and sampling processes

The number of non-local origin fish harvested in the fishery (C_{nl}) depends upon the proportion (p_{nl}) that non-local origin fish comprise of the pool of fish exposed to the fishery and the total harvest of fish (C_T).

$$C_{nl} = C_T * p_{nl} \quad (1)$$

The true catch of local-origin fish (C_l) is $(C_T - C_{nl})$. When the proportion that non-local origin fish comprise of the total pool of fish being exploited is small, the number of non-local origin salmon harvested can be quite small as well (Figure 2.3.4.1).

It is usually not possible to sample every fish that is harvested to identify its region of origin. Hence estimates of the total harvests of fish of each group are made from samples of the harvest. The number of samples collected and processed (S_T) is defined by the proportion of the catch sampled (p_{sample}) and the total catch (C_T):

$$S_T = C_T * p_{sample} \quad (2)$$

The number of non-local origin fish in the sample $(\hat{S}_{nl})$ is modelled as a hypergeometric process conditional on the catches of non-local origin fish (C_{nl}), the catch of local-origin fish (C_l), and the total samples drawn (S_T):

$$\hat{S}_{nl} \mid C_{nl}, C_l, S_T \sim HyperGeom(C_{nl}, C_l, S_T) \quad (3)$$

We assume that the identification of a fish sample to reporting group is 100% accurate. The occurrence of a non-local origin fish sample can frequently be zero when the proportion non-local origin fish is low, the catch is low, and the sampling proportion is low (Figure 2.3.4.2).

The catch of non-local origin fish in the fishery (C_{nl}) depends on the estimation of the proportion non-local origin fish in the fishery catches, conditional on the samples ($\hat{S}_{nl}$). The estimated proportion non-local origin fish ($\hat{p}_{nl}$) is modelled dependent on the realised attribution of the origin of the samples as:

$$\hat{S}_{nl} \mid \hat{p}_{nl}, S_T \sim Bin(\hat{p}_{nl}, S_T) \quad (4)$$

The estimated catch of non-local origin fish $(\hat{C}_{nl})$ is calculated from the posterior distribution of $\hat{p}_{nl}$ applied to the total catch:

$$\hat{C}_{nl} = \hat{p}_{nl} * C_T \quad (5)$$

Estimation of catch of non-local origin fish

The estimate of the catch of non-local origin fish based on samples of the fishery catches is positively biased relative to the "true" realised catch of non-local origin fish in almost all instances regardless of sampling rate (Figure 2.3.4.3). The bias is very large when catches are small, the proportion non-local origin fish in the pool is small, and the sampling intensity is low. Higher sampling rates or higher proportions of non-local origin fish in the fishery are required to provide an essentially unbiased estimate of the catch of non-local origin fish.

The coefficient of variation of the estimated catches is very high (> 50%), regardless of sampling intensity, when the percentage of non-local origin fish in the pool exploited is less than 0.2% (Figure 2.3.4.4). Sampling rates of 4% of the catch would provide estimates of catch with a CV < 50% when catch is large (15 000 fish) and the percentage non-local origin fish is 1% (or more). It is difficult to attain estimates of catch of non-local origin with a CV < 50% when catches are low or proportion non-local origin is low even at sampling rates of 20% of the catch.

Labrador Sampling Programme Context

Over the period 2015 to 2020, the sampling rate of the Labrador subsistence food fishery has ranged from 3.4% to 8.4% for size groups combined, and 2.5% to 4.7% for large salmon specifically (Table 2.3.4.1). Based on samples from all size groups, the estimated catch (median) of USA origin salmon ranged from eight fish (5th to 95th percentile range 1 to 36) in 2020 to 80 fish (5th to 95th percentile range 25 to 190) in 2017 (Figure 2.3.4.5). Considering only the large salmon size group from which the USA origin salmon were identified in 2017, the estimated catch varies from 15 fish (5th to 95th percentile range 1 to 53) in 2015 to 71 fish (5th to 95th percentile range 22 to 164) in 2017 (Figure 2.3.4.5). The coefficients of variation of the estimated catches of USA origin are very high, from 56% to 100%.

The estimated proportions of USA fish in the catch of all sizes, and hence in the pool of fish to be exploited, range from 0.09% (median, 5th to 95th percentile range 0.01% to 0.41%) in 2015 to 0.60% (0.19% to 1.44%) in 2017 (Figure 2.3.4.5). In the large salmon size group only, the estimated proportions USA fish range from 0.13% (0.01% to 0.62%) in 2018 to 1.73% (0.53% to 4.02%) in 2017 (Figure 2.3.4.5).

Based on the estimated proportions of USA origin fish from sampling (> 0.1% for all sizes; ~ 0.5% for large salmon only), we would expect the estimates of catches to be positively biased relative to true catches for the realised sampling rates of 3% to 5% (see Table 2.3.4.1 and Figures 2.3.4.3) and to have high uncertainty (Figure 2.3.4.4).

Conclusions

It is a challenging task to estimate occurrences of rare events as in the case of USA origin fish in the Labrador subsistence fishery catches. Positively biased and imprecise estimates of catches of USA origin salmon are obtained from the current realised sampling rates of 2% to 4% of the catch and with the percentage of non-local origin salmon in the fishery of 0.1% to 0.5%.

Informative values of the proportions USA origin salmon in the pool of fish potentially exploited at Labrador could be inferred from the estimates of returns of salmon to Labrador rivers and the corresponding returns to rivers in USA, and specifically for large salmon. During 2015 to 2019, returns of large salmon to rivers in the USA were 392 to 1137 fish, compared to returns to Labrador of large salmon of 27 140 to 88 860 fish; equivalent to 0.54% in 2016 to 4.0% in 2019 (ICES, 2020) of combined USA and Labrador. However, because of the timing of the Labrador fishery (begins in mid-June and extends into September) and the returns of salmon to rivers in USA (beginning in May and well advanced by late June), a large proportion of USA origin salmon would not be in the Labrador area at the time of the fishery and the proportion of the expected catch comprised of USA origin salmon would be much less than inferred from returns. Considering this and the estimated proportions from samples, the USA origin fish are concluded to comprise a small proportion (< 1%) of the potential pool of fish exploited at Labrador.

In the absence of sampling and analysing every fish caught for origin, the posterior distribution of estimated catch of USA origin fish will always include values greater than zero. Recognising that rare events are difficult to estimate from sampling, the choice of sampling design is perhaps better considered by posing the question of how much catch of USA origin fish in the Labrador fishery, or any non-local origin salmon in mixed-stock fisheries, represents an unacceptable loss to the population. A catch of ten USA origin large salmon in the Labrador fishery represents a loss of 1% of the average returns of 2SW salmon to rivers in USA during 2015 to 2019, whereas a catch of 50 salmon represents a loss of 5% of returns.

A sampling rate of at least 10% of the fishery catches in Labrador would be required to achieve a relatively unbiased estimate of the catch of USA origin salmon with a coefficient of variation < 50% under current fisheries catches and estimated proportions USA origin salmon in the pool of fish exploited.

This scenario analysis was done using two groups of fish, local and non-local origin. The diversity of Atlantic salmon in eastern Canada can be resolved to 21 reporting groups (Bradbury *et al.*, 2021; ICES, 2020). Based on genetic analyses, it was concluded that 95% to 97% of the catch of salmon in the Labrador fishery assigned to the Labrador reporting groups (Bradbury *et al.*, 2015; ICES, 2019; 2020). In 2020, samples were assigned to nine reporting groups, with > 0.80 probability of assignment, including three groups from Labrador (97% of the 679 samples) and six other groups but no samples were assigned to USA origin salmon. Using a multinomial model, the estimated catch of USA origin salmon in 2020 based on samples and catches from all size groups was eight fish (median, 5th to 95th percentile range one to 36 fish), identical to the previous analysis based on local and non-local groups only. This indicates that the scenario analyses conducted for two groups would also apply in the case of multiple reporting groups when estimating catches for reporting groups that are at a low relative abundance in the fishery.

2.3.5 Research projects on pink salmon in the northern border rivers between Finland and Norway

The unprecedented pink salmon (*Oncorhynchus gorbuscha*) occurrence across the North Atlantic area in 2017 and 2019 was also evident in the rivers Teno (Tana in Norwegian) and Näätämöjoki (Neidenelva in Norwegian), two major Atlantic salmon rivers in the northernmost Finland and

Norway. The recent odd year abundances of pink salmon in these rivers provide the basis to expect substantial runs also in 2021 and 2023.

A research project on pink salmon, funded by the Finnish Ministry of Foreign Affairs, is planned for 2021. A central part of this project is telemetry tracking of pink salmon ascending the Teno river that will be run in close collaboration with the Norwegian Institute of Nature Research (NINA) and local fisheries organisations. Pink salmon migration in this large river system will be studied, examining timing, migration speed and ascendance to tributaries, and especially the occurrence and behaviour of pink salmon at spawning areas of Atlantic salmon in different parts of the catchment. Pink salmon will be also sampled for possible pathogens and parasites, and analysis will be done by the Finnish Food Authority. Samples of eDNA will be collected across different tributaries of the Teno (in collaboration with NINA) to further detect the occurrence of pink salmon in different parts of the large river system. Pink salmon will have a special focus at all monitoring sites in tributaries where Atlantic salmon runs and spawning populations are monitored using sonars, video cameras and snorkelling.

A second project on pink salmon has been planned for 2022–2023, and a proposal for funding has been submitted in spring 2021. The plan is to run a similar tracking project on pink salmon in 2023, but this time in the River Näätämöjoki. Collaboration and networking will be further developed between Finland, Norway and Russia, especially with regards to the Barents Sea area, their Atlantic salmon populations and the future scenarios of impacts by pink salmon and possible mitigation measures. In addition, an update of the distribution of another alien species, bullhead (*Cottus gobio*), in the Teno river system will be carried out in 2022.

2.3.6 Studies relating to the reintroduction of Atlantic salmon in the River Rhine, Germany

The German project "GeMoLaR" started in 2020 (duration: 2020–2024, website: https://www.gemolar.fish) as part of the international coordinated genetic monitoring of reintroduced Atlantic salmon in the whole Rhine area. The project is funded by the Federal Ministry of Food and Agriculture via the Federal Office for Agriculture and Food, and is carried out by the University of Koblenz-Landau and nine project partners from Baden-Württemberg, Hesse, North Rhine-Westphalia and Rhineland-Palatinate. As in the other countries bordering the Rhine, i.e. France, Switzerland and the Netherlands, the salmon are genetically sampled according to a standardised protocol. Microsatellite (SALSEA-merge panel) based parentage analyses will be used to investigate restocking success and the efficiency of different restocking strategies (i.e. age, parents used, origin of broodstock). Examination of more samples including from wild returning fish is planned from 2021 to 2024.

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. 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 2020[1].

In each Commission Area, the request includes:

- describe the key events of the 2020 fisheries[2] (ToR 2.1, 3.1, 4.1)

with specifics provided in footnotes 1 and 3:

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 2021 Data Call

On 29 January 2021, ICES communicated the Data Call for Atlantic salmon from the North Atlantic to ICES Member Countries. The salmon call was contained within the wider "Joint ICES Fisheries Data call 2021 for landings, discards, biological sample, catch and effort data" (see Data calls (ices.dk)). Subsequently on 8 February 2021, the chair of the WGNAS copied the ICES Data Call to members of the Working Group. The Data Call included instructions in a covering letter and a template spreadsheet in Excel as attachments (Annex 7.12.1 WGNAS template.xlsx). The request was for members to return the catch data for 2020 to ICES by 15 March 2021.

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, 2.1.1.3, 2.1.2.1, 2.1.3.1, 2.1.3.2, 2.2.1.1, 2.2.2.1, Annex 4; Figures 2.1.1.1a,b, 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. The Data Call request would, in the future, also provide catch data that are used in the North Atlantic wide Life-Cycle Model (LCM, see below).

In previous years, the data requested in the Data Call would have been compiled by members of the Working Group from national working papers and summarised in the report. The ICES Data Call has resulted in more prompt and comprehensive 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 15 March 2021):

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

Some reports were received after the deadline because of issues with the communication of the official request. These have been noted by ICES and the countries, and solutions will be found to make the process more successful in future years.

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

The data submitted in March 2021 were reviewed by the Working Group and some issues were identified. Details of the review and proposed changes are outlined in Annex 8.

2.5 Progress on the Bayesian Life Cycle Model

A new Bayesian Life Cycle Model (LCM) has been proposed to improve the biological realism of the stock assessment model and to advance exploration of factors that are driving salmon abundance. The Working Group previously reviewed developments in modelling and forecasting the abundance of Atlantic salmon using the new LCM (ICES, 2018; 2019; 2020).

Following discussions at the WGNAS 2020, in preparation for a future Benchmark and the application of the LCM by the WGNAS for the assessment and multi-year catch advice, a workshop of jurisdictional experts and modelers working on Atlantic salmon in the North Atlantic was held 5–8 January 2021, remotely.

The objectives of the workshop (WKSalModel) as defined in the terms of reference included:

- To contribute to building a shared vision among the WGNAS expert group of the new methodological framework used for providing catch advice based on the life cycle model.
- To familiarise ICES experts in the use of the LCM, that is currently coded in R using the package NIMBLE.
- To discuss and formalise the workflow from data specification, preparation, and maintenance to the production of the assessment and for the provision of multiple year forecasts and catch advice.
- To discuss and prioritise next steps with priority on timelines for data inputs, running life cycle model for assessment and catch advice during WGNAS March 2021, and on preparing the ICES WGNAS 2022 benchmark process.

A first draft of the WKSalModel report was circulated and reviewed by WGNAS 2021.

2.5.1 Advances in using the LCM for stock assessment and provision of catch advice

The workshop reviewed the LCM which incorporates all stocks of Atlantic salmon at the North Atlantic scale in a single model, reviewed comparisons of current ICES PFA models and the life cycle model approach, and discussed the data inputs and process for running the LCM.

The LCM and its application to the development of multi-year catch advice (workflow from data input – model fitting – forecasting) was presented to WGNAS 2021.

The life cycle model framework is embedded within a suite of R-programmes based on the Nimble package and a shiny web application that has been made available online (https://sirs.agrocampus-ouest.fr/discardless_app/WGNAS-ToolBox/). These new tools simplify and strengthen the robustness of the stock assessment workflow from the data input to the production of catch advice.

Timelines for providing data from jurisdictions for input to the LCM were discussed and it was indicated that data from jurisdictions are generally not ready until March of the assessment year, which further strengthens the need to have automated processes for the ICES PFA model and the new life cycle model processes. Such an automated process was developed and used during WGNAS 2021 to run the LCM using the WGNAS 2021 updated data.

2.5.2 Feedback from the WKSalModel

The feedback on the new LCM received during the WKSalModel was positive. The group supported the use of the LCM for Atlantic salmon stock assessment and the provision of catch advice. The development of the data base and the associated shiny app is acknowledged as a new tool to substantially streamline the workflow from data preparation and maintenance through to the provision of catch advice. It increases transparency in the way the data are used and strengthens data quality control.

Because of the limited time during the WKSalModel, R-programmes were not reviewed in details. All R-code was made available and feedback was received between January 2021 and the WGNAS in March 2021 that helped to improve the coding.

Examples of synthetic outputs from the LCM (Figures and Tables) were presented during the WKSalModel and during WGNAS 2021. Some feedback was received and further discussions are needed to better align the outputs routinely produced to the needs of WGNAS.

The new LCM can be expanded to assimilate new data or knowledge. It encourages the improvement of the data by experts of the different jurisdictions to better align the data with the amount of knowledge and expertise available locally. Discussions were held during the WKSalModel and during WGNAS 2021 to prioritise data and model improvements and to set a realistic and achievable time schedule for those improvements.

2.5.3 Resolutions and next steps

The decision was made during the WKSalModel to provide the 2021 assessment and provision of catch advice based on the PFA models, and not based on the new LCM.

The LCM was run in parallel with the PFA models during WGNAS 2021, using the data updated to 2020, and the results of the PFA models and LCM outputs were compared.

The WGNAS and ICES agreed to initiate a first ICES WGNAS benchmark process in 2021. The ToRs of the benchmark remain to be specified but would include the following topics:

- Review R-code and workflow of the LCM.
- Prioritise data and model improvements, and set a realistic and achievable time schedule for those improvements.
- Define a strategy for maintenance and hosting of the database and the shiny app. Start discussion with other working groups that have proposed similar tools (e.g. WGEEL), and with ICES that could bring support for development and hosting.
- Consider modifications to the Data Call to address the LCM data requirements.

WKSalModel and WGNAS 2021 acknowledge that guidance / decisions from NASCO are required to complete the LCM forecast / catch advice process. The LCM considers the population dynamics of 25 stock units of North Atlantic salmon in one cohesive model with linked marine dynamics. The LCM includes changes from the PFA models in how sea-age groups contribute to egg depositions and to fisheries. The LCM includes forecasting and catch advice components that require guidance from managers to support the decision-making process. It would be important for completing the LCM model framework and for the ICES Benchmark that NASCO provide guidance / decisions on elements of the catch advice process. The most important ones are:

- How to incorporate homewater catch scenarios in the marine fisheries scenarios. In the current PFA model and catch advice process, a sharing agreement of 60:40 homewater to Greenland catches is used (West Greenland / 0.4). For the Faroes, a similar adjustment is made using a Faroes / NEAC specific rate of 8.4% (catch scenario = Faroes / 0.084). There are alternatives to this; for example, using homewater catches of the previous five years as a default homewater catch that would occur regardless of the marine fishery catch option.
- The LCM incorporates the eggs from all spawners and assesses compliance using eggs from all spawners relative to the conservation limits of eggs from all sea-ages. Previously, ICES has provided analyses of compliance to sea-age specific spawner requirements, by stock complex and to countries which indicates a desire to ensure conservation of sea-age diversity in the spawners. The LCM is flexible and can generate outputs to assess compliance for eggs from all sea-age groups or track egg depositions by sea-age group and assess compliance relative to sea-age-specific conservation limits.
- The LCM can assess catch scenarios independently for Greenland and Faroes, but more interestingly, it can provide catch advice for the joint fisheries at Greenland, Faroes and homewaters simultaneously. Similarly, risk of attainment of conservation limits for catch options can be presented by individual stock unit (25 in total), by regional groups (three stock complexes) or any combination of jurisdictions and sea-age components.

These three main elements are related and guidance from NASCO regarding their preference for addressing catch scenarios and presentations of the catch option outputs are required to complete the LCM framework and ensuring a complete Benchmark review of the LCM model for the development of future catch advice for NASCO.

Because of the importance of the topics to be addressed, a workshop is proposed for late 2021 / early 2022 to prepare the elements of LCM and PFA model descriptions, data inputs, and workflow processes in preparation for the ICES Benchmark process.

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

2.6.1 WGDIAD

The Working Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species (WGDIAD) provides a forum for the coordination of ICES activities relating to species which use both freshwater and marine environments to complete their life cycles; such as eel, Atlantic salmon, sea trout, lampreys, shads, smelts, etc. The Working Group considers progress and future requirements in the field of diadromous science and management and organises Expert Groups (EGs), Theme Sessions and Symposia. There is also a significant role in coordinating with other science and advice Working Groups in ICES.

The annual meeting of WGDIAD was held remotely (by WebEx) from 1–3 September 2020, and chaired by Hugo Maxwell (Ireland) and Dennis Ensing (UK). There were 23 participants in total from nine countries who participated in the meeting for at least one of the days. The following topics relevant to Atlantic salmon were discussed:

- International Year of the Salmon (IYS)–progress and symposium plans;
- A progress report of the work of the Intersessional Sub Group Diadromous fish (ISSG Diad) of the Regional Coordination Groups (RCGs). The subgroup has a coordinating function and identifies data collection needs for diadromous species in relation to the EU data collection regulation;
- A theme session proposal for the ICES ASC 2022, to be submitted in 2021, on exotic species (and stocks) and their impact on native species and their fisheries;
- A discussion on a formal ICES/WGDIAD link with diadromous fish scientists in the Pacific within organisation such as the North Pacific Marine Science Organisation (PICES) and North Pacific Anadromous Fish Commission (NPAFC);
- A report from The Workshop on Evaluating the Draft Baltic Salmon Management Plan meetings (WKBaltSalMPI & II) on the progress developing a salmon management plan for the Baltic Sea;
- A report by Mark Saunders from NPAFC on the 2019 and 2020 marine surveys targeted to better understand Pacific salmon winter ecology in the Gulf of Alaska.

Since the 2020 Annual Meeting, the group has worked with ICES and NPAFC to submit proposals under the United Nations Decade of Ocean Science for Sustainable Development (UNDOS) call for projects, both aimed at strengthening the management of the oceans, including for anadromous salmonids. It is expected that during 2021 more details will emerge on the success of these submissions, and how WGDIAD, ICES, and their Pacific partners will further shape this proposed Pacific-Atlantic diadromous fish science link. An intersessional WGDIAD meeting discussing these plans is planned for the summer of 2021, with input requested from all ICES diadromous fish EG chairs.

The next meeting of WGDIAD will be held at a date to be confirmed during the 2021 ICES ASC in Copenhagen, Denmark (6–9 September 2021).

2.6.2 Diadromous fish and EU Data Collection Framework update

The EU Data Collection Framework (DCF) is a data collection framework established in line with the European Union's common fisheries policy to collect and utilise scientific data for management advice. Given the geographical span as well as the regional need to organise and coordinate data collection for diadromous species, the need for a pan-regional subgroup on these species (eel, salmon, sea trout) was discussed in 2016 which led to initialisation of a specialised subgroup focussing on DCF-relevant diadromous fishes. The diadromous subgroup (DSG, more recently Intersessional Sub-Group, ISSG) is a specialised, pan-regional subgroup in order to focus on advice on what needs to be done for regional workplans for diadromous species in line with DCF data collection, including listing end-user needs (variables required, frequency, intensity), possible needs for regional agreements (e.g. setting index rivers) and time frames for implementation.

The pan-regional and sub-group approach was further developed in 2018, so that sub-groups would work intersessionally but reporting to the annual Regional Coordination Groups (RCGs) (meetings. Inter-regional stock assessment and management advice for diadromous species demands regionally adapted approaches in order to sustain best comparability of data and to consider regional characteristics and differences. Thus, it is of importance to coordinate EU Multi-

Annual Programme (MAP)-based data collection of diadromous species adapted to the respective regions represented by RCGs on the basis of the direct input of end-users such as designated ICES expert groups (e.g. WGNAS).

The overall task of the ISSG Diad thus is now to progress development of the regional work/sampling plans for data collection for diadromous species/stocks (Atlantic salmon in the Atlantic and Baltic, sea trout in the Baltic, European eel throughout its natural range) and quality assurance of those data.

ISSG considers it necessary to regularly consult with designated end users / expert groups on input and details of what data are needed for improvement of inter-regional assessment and management of each diadromous species to allow a more directed and purposeful data collection towards the designated end-user needs.

2.7 NASCO has asked ICES to provide a compilation of tag releases by country in 2020

Data on releases of tagged, fin-clipped and other marked salmon in 2020 were provided to the Working Group and are compiled as a separate report (ICES WGNAS Addendum, 2021). In summary (Table 2.7.1), approximately 1.96 million salmon were marked in 2020, a decrease from the 2.2 million fish marked in 2019. The adipose clip was the most commonly used primary mark (1.65 million) with around half (0.836 million) of these marked and released in Russia. Coded wire microtags (CWT) (0.196 million) were the next most common primary mark, and 91 390 fish were marked with internal tags. Most marks were applied to hatchery-origin juveniles (1.73 million), while 40 678 wild juveniles, 31 032 wild adults and 160 355 hatchery adults were also marked. The use of Passive Integrated Transponder (PIT) tags, Data Storage Tags (DSTs), radio and/or sonic transmitting tags (pingers) has increased in recent years but in 2020, 91 390 salmon were tagged with these tag types (Table 2.7.1) which was a marked decrease from previous year (161 705). Reduced numbers of tagged salmon in 2020 may in some countries be related to restrictions due to the COVID-19 pandemic.

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. The creation of a database listing individual PIT tag numbers or codes identifying the origin, source or programme of the tags should be implemented 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 have 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, where in recent years, 17 out of 21 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), 1960–2020 (2020 figures include provisional data).

Year	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	Rach (15)	Denmark	Finland	Ireland(5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)(16)	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	-	-
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	-	-

Year	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	Rach (15)	Denmark	Finland	Ireland(5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)(16)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
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	-	-
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-

Year	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	Rach (15)	Denmark	Finland	Ireland(5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)(16)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
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	-	<0.5	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	<0.5	19	-	2247	1032	-
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	-

Year	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	Rach (15)	Denmark	Finland	Ireland(5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)(16)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
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	<0.5	27	-	1629	421	-
2012	126	0	3	696	82	50	20	21	9	12	64	88	58	9	124	10	7	0	0.5	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	-
2014	118	0	4	490	81	51	18	24	6	9	58	57	54	5	84	12	6	0	<0.5	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	66	24	6	10	12	32	59	49	5	27	10	2	0	<0.5	28	-	1156	353	-
2018	79	0	1	594	80	60	22	9	4	11	24	46	42	4	19	10	3	0	1	39	-	1049	311	-
2019	100	0	1	513	57	37	14	9	8	13	21	44	5	2	13	15	5	0	1	28	-	885	259	-
2020	104	0	2	527	49	42	28	7	7	9	16	62	3	1	13	9	5	0	1	31	-	915	276	-
Mean																								
2015–2019	113	0	3	594	64	66	25	8	6	11	35	54	50	4	31	11	4	0	1	35	-	1 113	317	-

Year	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	Rach (15)	Denmark	Finland	Ireland(5,6)	UK (E & W)	UK (N.Irl.) (6,7)	UK (Scotl.)(16)	France (8)	Spain (9)	Faroes (10)	East Grld	West Grld.(11)	Other (12)	Total Reported Nominal Catch	NASCO areas (13)	International waters (14)
2010–2019	128	0	3	597	74	79	27	12	8	11	43	69	69	6	82	11	5	0	1	38	-	1 262	339	-

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% UK (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.

16. Scotland data for 2020 not available at time of printing, 2019 used as Provisional.

Table 2.1.1.2. Total reported nominal catch of salmon in homewaters by country (in tonnes round fresh weight), 1960–2020 (2020 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)			USA	Norway(2)			Russia(3)	Iceland		Sweden		Denmark	Finland			Ireland(4,5)			UK (E&W)	UK (N.I.)(4,6)	UK (Scotland)(7)			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
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
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

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway(2)				Iceland		Sweden			Finland			Ireland(4,5)					UK (Scotland)(7)					
				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
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
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

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)(7)			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
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
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

Year	NAC Area				NEAC (N. Area)												NEAC (S. Area)										Total
	Canada (1)				Norway(2)				Iceland		Sweden			Finland			Ireland(4,5)					UK (Scotland)(7)					
				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
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
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	667	47	66	24	6	10	12	27	5	32	-	-	59	49	5	19	7	27	10	2	1125
2018	39	39	79	0	427	167	594	80	60	22	9	4	11	13	11	24	-	-	46	42	4	12	8	19	10	3	1008

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)(7)			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
2019	47	53	100	0	391	122	513	57	37	14	9	8	13	17	4	21	-	-	44	5	2	8	5	13	15	5	854
2020	49	55	104	0	384	143	527	49	42	28	7	7	9	13	3	16	-	-	62	3	1	8	5	13	9	5	882
Mean																											
2015–2019	50	62	113	0	449	145	594	64	66	25	8	6	11	25	10	35	-	-	54	50	4	19	11	31	11	4	1075
2010–2019	53	74	128	0	447	150	597	74	79	27	12	8	11	29	15	44	-	-	69	69	6	55	27	82	11	5	1216

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.

7. Scotland data for 2020 not available so 2019 data provided as Provisional.

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, 1996 to 2020. 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
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
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	6	6	40	40	54	54	100
Canada	2020	7	7	44	42	53	51	104
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
		Weight (t)	% of to-tal	Weight (t)	% of to-tal	Weight (t)	% of total	Weight (t)
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
Finland	2020	0	0	0	0	16	100	16
France (1,4)	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	2	8	52	7	46	15
France	2020	0	1	4	48	4	51	8
Iceland (6)	1996	11	9	0	0	111	91	122

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
Iceland	1997	0	0	0	0	156	100	156
Iceland	1998	0	0	0	0	164	100	164
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	90	100	90
Iceland	2018	0	0	0	0	82	100	82
Iceland	2019	0	0	0	0	51	100	51
Iceland	2020	0	0	0	0	70	100	70
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

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
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
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	35	29	65	45
Ireland	2020	0	0	17	27	46	73	62
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
Norway	2020	215	41	0	0	312	59	527

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
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
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	39	0	0	35	61	57
Russia	2020	16	34	0	0	32	66	49
Spain (5)	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

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of to-tal	Weight (t)	% of to-tal	Weight (t)	% of total	Weight (t)
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
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
Spain	2020	0	0	0	3	5	97	5
Sweden (3)	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

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
Sweden	2020	0	0	0	0	14	100	14
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
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	12	4	88	5
UK(E & W)	2020	0	0	0	0	3	100	3
UK(N. Ire)	1999	44	83	9	17	na	na	53
UK(N. Ire) (2)	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

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
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
UK(N. Ire)	2019	0	0	0	0	2	100	2
UK(N. Ire)	2020	0	0	0	0	1	100	1
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
UK(Scot)(7)	2020	0	0	2	14	11	86	13
Denmark	2008	0	1	0	0	9	99	9

Country	Year	Coastal		Estuarine		In-river		Total
		Weight (t)	% of total	Weight (t)	% of total	Weight (t)	% of total	Weight (t)
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
Denmark	2020	0	0	0	0	9	100	9

Key:

1. An illegal net fishery operated from 1995 to 1998, catch unknown in the first three years but thought to be increasing. Fishery ceased in 1999. 2001/2002 catches from the illegal coastal net fishery in Lower Normandy are unknown.

2. Rod catch data for river (rod) fisheries in UK (Northern Ireland) from 2002.

3. Estuarine catch included in coastal catch.

4. Coastal catch included in estuarine catch.

5. Spain catch to 2018 was Asturias catch raised, 2019 data for All Spain.

6. Iceland total catch includes ranched fish.

7. Scotland 2020 data not available at time of printing, 2019 data inserted as Provisional.

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, 1991–2020. Figures for 2020 are provisional.

Year	Canada (4)		USA		Iceland		Russia (1)		UK (England & Wales)		UK (Scot-land)(5)		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										
2004	62316	57	0	-	7362	16	24679	76	13211	48	46279	50					255	19				

Year	Canada (4)		USA		Iceland		Russia (1)		UK (England & Wales)		UK (Scotland)(5)		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
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	9249	43	3247	49	4613	79	557	19	22024	22
2019	60636	72	0	-	15185	52	12762	74	8171	89	43825	91	9790	48	5000	85	3913	70	678	20	21178	20
2020	59627	72	0	-	21277	51	9508	65	10672	93	43825	91	13240	44	4813	91	4375	69	587	16	28753	23

Year	Canada (4)		USA		Iceland		Russia (1)		UK (England & Wales)		UK (Scotland)(5)		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																						
2015–2019	61674	70	0	-	19785	42	10298	70	8819	84	44313	90	10384	43	1753	87	3950	72	567	18	23951	21
% change; recent year relative to mean																						
	-3	3	-	-	8	20	-8	-7	21	11	-1	1	28	2	175	5	11	-4	4	-12	20	13

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 are 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 are 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.

5. Scotland 2020 data not available at time of printing, 2019 data provided as Provisional.

Table 2.1.3.1. Estimates of unreported catches by various methods in tonnes within national EEZs in the Northeast Atlantic, North American and West Greenland Commissions of NASCO, 1987–2020.

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
2014	256	21	10	287

Year	Northeast Atlantic	North America	West Greenland	Total
2015	298	17	10	325
2016	298	27	10	335
2017	318	25	10	353
2018	277	24	10	311
2019	237	12	10	259
2020	239	27	10	276
Mean				
2015–2019	285	21	10	317

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 or 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 2020.

Commission Area	Country	Unreported Catch (t)	Unreported as % of Total North Atlantic Catch (Unreported + Reported)	Unreported as % of National Catch (Unreported + Reported)
NEAC	Denmark	1	0.1	12
NEAC	Finland	2	0.1	19
NEAC	Iceland	1	0.1	2
NEAC	Ireland	6	0.5	9
NEAC	Norway	226	19.8	30
NEAC	Sweden	1	0.1	9
NEAC	UK (E & W)	0	0.0	9
NEAC	UK (N. Ireland)	0.3	0.0	22
NEAC	UK (Scotland)**	1	0.1	9
NAC	USA	0	0.0	0
NAC	Canada	27	2.4	21
WGC	Greenland	10	0.9	24
Total Unreported Catch*		276	24.2	
Total Reported Catch of North Atlantic Salmon		916		

* No unreported catch estimates available for France, Russia, Saint Pierre and Miquelon, or Spain in 2020.

** No Scotland 2020 data at time of printing, 2019 data input as Provisional.

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), 1980–2020.

Year	North Atlantic Area											Outside the North Atlantic Area						
	Norway	UK (Scotland)	Faroes	Canada	Ireland	USA	Iceland	UK (N. Ireland)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Australia	Turkey	Total	World-wide 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
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

Year	North Atlantic Area										Outside the North Atlantic Area						
	Norway	UK (Scotland)	Faroes	Canada	Ireland	USA	Iceland	UK (N. Ireland)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Australia	Turkey	Total	World-wide Total
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
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	60 967	41 448	12 196	6031	1083	-	8500	-	1 354 217	264 349	7467	83 144	36 662	0	391 622	1 745 839
2012	1 232 095	162 223	76 596	52 951	12 440	-	2923	-	8754	-	1 547 982	399 678	8696	79 981	43 982	0	532 337	2 080 319
2013	1 168 324	163 234	77 184	47 649	9125	-	3018	-	16 097	-	1 484 631	492 329	6834	74 673	42 776	0	616 612	2 101 243
2014	1 258 356	179 022	86 490	29 988	9368	-	3965	-	18 675	-	1 585 864	644 459	6368	54 971	41 591	0	747 389	2 333 253

Year	North Atlantic Area											Outside the North Atlantic Area						
	Norway	UK (Scotland)	Faroes	Canada	Ireland	USA	Iceland	UK (N. Ireland)	Russia	Spain	Total	Chile	West Coast USA	West Coast Canada	Australia	Turkey	Total	World-wide Total
2015	1 303 346	171 722	80 629	48 684	13 116	-	3260	-	3232	8	1 623 997	608 546	10 431	92 926	48 331	0	760 234	2 384 231
2016	1 233 619	162 817	83 291	33 011	16 300	-	8420	-	12 857	5	1 550 320	532 225	8017	90 511	56 115	0	686 868	2 237 188
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
2018	1 278 596	156 025	78 973	36 174	12 200	-	13 448	-	20 216	-	1 595 632	660 645	8326	87 010	61 227	0	817 208	2 412 840
2019	1 361 747	203 881	94 993	43 923	19 300	-	26 957	-	20 734	12	1 771 547	660 645	-	88 874	61 227	0	810 746	2 582 293
2020	1 393 108	207 630	88 961	43 923	14 500	-	34 341	-	38 889	-	1 821 352	660 645	5552	88 874	61 227	0	816 298	2 637 650
Mean																		
2015–2019	1 283 014	176 830	84 943	39 347	16 044	-	12 670	-	14 011	12	1 626 870	615 134	8324	88 986	55 896	0	766 675	2 393 545
% change; recent year relative to mean																		
	9	17	5	12	-10	-	171	-	178	-	12	7	-33	0	10	-	6	10

Notes:

- Data for 2020 are provisional for many countries.

- Where production figures were not available for 2020, values for the most recent year were assumed.

- West Coast USA = Washington State.

- 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, 2018 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, no data reported for 2020.

Table 2.2.2.1. Production of ranched salmon in the North Atlantic (tonnes round fresh weight), 1980–2020.

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
2007	35.5	3.1	0.3	9.7	0.5	49

Year	Iceland [1]	Ireland [2]	UK (N. Ireland) River Bush [2,3]	Sweden [2]	Norway various facilities [2]	Total production
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	13.7	3.6	-	8.0	-	25
2020	28.2	3.3	-	7.0	-	39
Mean						
2015–2019	25.0	3.4	-	6.4	-	34.7
% change; recent year relative to mean						
	13	-4	-	10	-	11

Notes:

1. From 1990 to 2000, catch includes fish ranched for both commercial and angling purposes. No commercial 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 2.3.4.1 Labrador subsistence fishery catches (number of fish), samples processed for genetic stock identification, the proportion of the catch sampled annually, and the number of USA origin fish identified in the samples, 2015 to 2020. The 2020 catch data are from SFA 1A and 2 only. The samples in 2020 are those with >80% probability of individual assignment.

Year	Total catch (large only)	Total samples (large only)	Percentage sampled (large only)	USA samples (large only)
2015	15 070 (6147)	728 (196)	4.8 (3.2)	0 (0)
2016	13 236 (5598)	445 (155)	3.4 (2.8)	0 (0)
2017	13 060 (6192)	492 (292)	3.8 (4.7)	2 (2)
2018	12 459 (4085)	499 (153)	4.0 (3.7)	0 (0)
2019	12 858 (5808)	485 (146)	3.8 (2.5)	0 (0)
2020	8 070 (3397)	679 (146)	8.4 (4.3)	0 (0)
Overall	74 753 (31 227)	3328 (1088)	4.5 (3.5)	0.1% (0.2%)

Table 2.7.1 Summary of Atlantic salmon tagged and marked in 2020 - '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
Canada	Hatchery Adult	0	1414	10	513	1937
	Hatchery Juvenile	0	964	0	0	964
	Wild Adult	0	934	11	758	1703
	Wild Juvenile	0	11 666	7630	824	20 120
	Total	**0**	**14 978**	**7651**	**2095**	**24 724**
Denmark	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	306 000	0	306 000
	Wild Adult	0	0	0	870	870
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**0**	**306 000**	**870**	**306 870**
France	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	3960	0	3960
	Wild Adult	0	0	0	575	575
	Wild Juvenile	0	0	0	2912	2912
	Total	**0**	**0**	**3960**	**3487**	**7 447**
Iceland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	60 126	0	0	0	60 126
	Wild Adult	0	165	0	0	165
	Wild Juvenile	2687	0	0	382	3069
	Total	**62 813**	**165**	**0**	**382**	**63 360**
Ireland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	126 713	0	0	0	126 713
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	2441	2441
	Total	**126 713**	**0**	**0**	**2 441**	**129 154**
Norway	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	3609	0	52 965	56 574

		Primary Tag or Mark				
Country	Origin	Microtag	External mark[2]	Adipose clip	Other Internal[1]	Total
	Wild Adult	0	436	0	23 229	23 665
	Wild Juvenile	0	501	0	80	581
	Total	**0**	**4546**	**0**	**76 274**	**80 820**
Russia	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	836 774	0	836 774
	Wild Adult	0	238	0	0	238
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**238**	**836 774**	**0**	**837 012**
Spain	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	91 518	0	91 518
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**0**	**91 518**	**0**	**91 518**

[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	158 418	0	158 418
	Hatchery Juvenile	0	0	0	0	0
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**0**	**158 418**	**0**	**158 418**
UK (England &	Hatchery Adult	0	0	0	0	0
Wales)	Hatchery Juvenile	0	0	9600	0	9600
	Wild Adult	0	564	0	0	564
	Wild Juvenile	607	0	8263	100	8970
	Total	**607**	**564**	**17 863**	**100**	**19 134**
UK (N. Ireland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	5549	0	63 440	0	68 989
	Wild Adult	0	0	0	0	0
	Wild Juvenile	0	0	0	0	0
	Total	**5549**	**0**	**63 440**	**0**	**68 989**
UK (Scotland)	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	21 500	0	21 500
	Wild Adult	0	585	0	1	586
	Wild Juvenile	0	385	0	1995	2380
	Total	**0**	**970**	**21 500**	**1996**	**24 466**
Germany	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	77 000	1286	78 286
	Wild Adult	0	15	0	0	15
	Wild Juvenile	0	0	10	0	10
	Total	**0**	**15**	**77 010**	**1286**	**78 311**
Greenland	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	0	0	0

		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	129	66	195
	Total	**0**	**0**	**129**	**66**	**195**
USA	Hatchery Adult	0	0	0	0	0
	Hatchery Juvenile	0	0	68 030	0	68 030
	Wild Adult	0	88	170	2393	2651
	Wild Juvenile	0	0	0	0	0
	Total	**0**	**88**	**68 200**	**2393**	**70 681**
All Countries	Hatchery Adult	0	1414	158 428	513	160 355
	Hatchery Juvenile	192 388	4573	1 477 822	54 251	1 729 034
	Wild Adult	0	3025	181	27 826	31 032
	Wild Juvenile	3294	12 552	16 032	8800	40 678
	Total	**195 682**	**21 564**	**1 652 463**	**91 390**	**1 961 099**

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

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

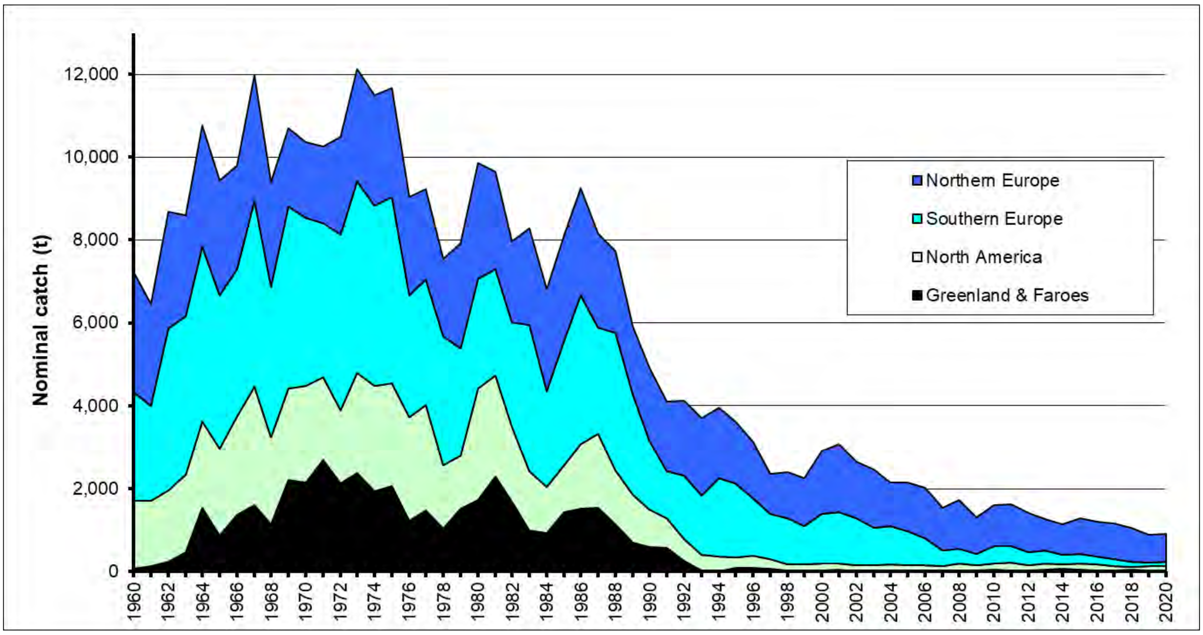


Figure 2.1.1.1. (a) Total reported nominal catches of salmon (tonnes round fresh weight) in four North Atlantic regions, 1960–2020.

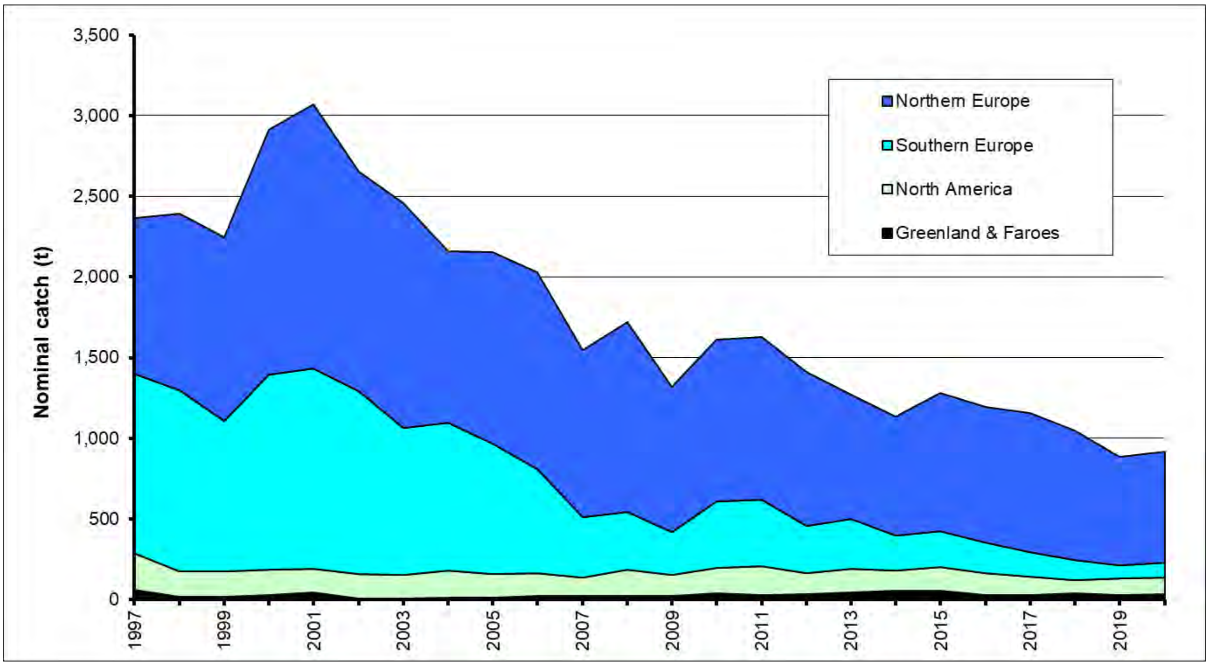


Figure 2.1.1.1. (b) Total reported nominal catches of salmon (tonnes round fresh weight) in four North Atlantic regions, 1997–2020.

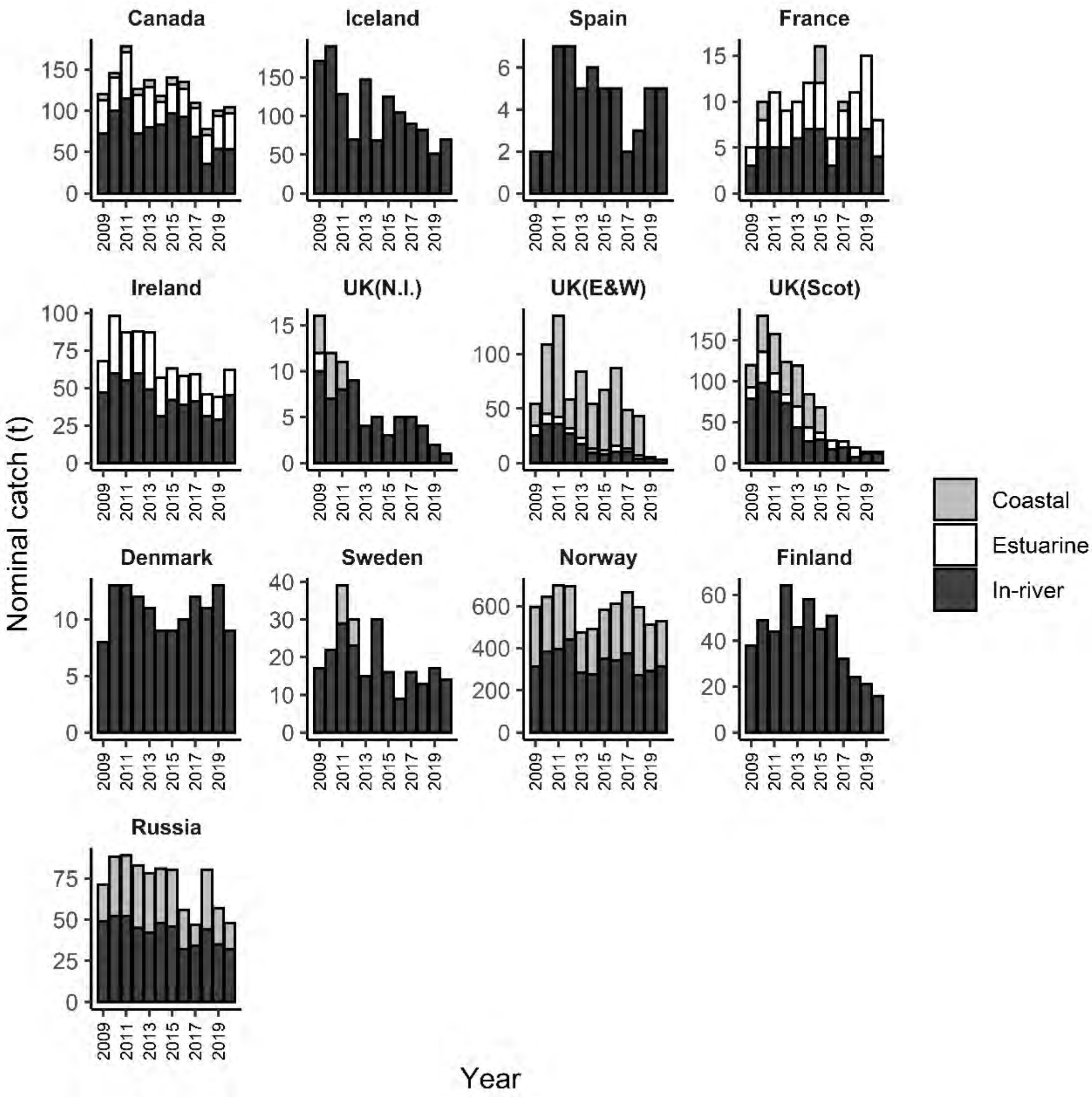


Figure 2.1.1.2. Nominal catch (tonnes round fresh weight) taken in coastal, estuarine and in-river fisheries by country, 2009–2020. The way in which the nominal catch is partitioned among categories varies between countries, particularly for estuarine and coastal fisheries, see text for details. Note also that the y-axes scales vary.

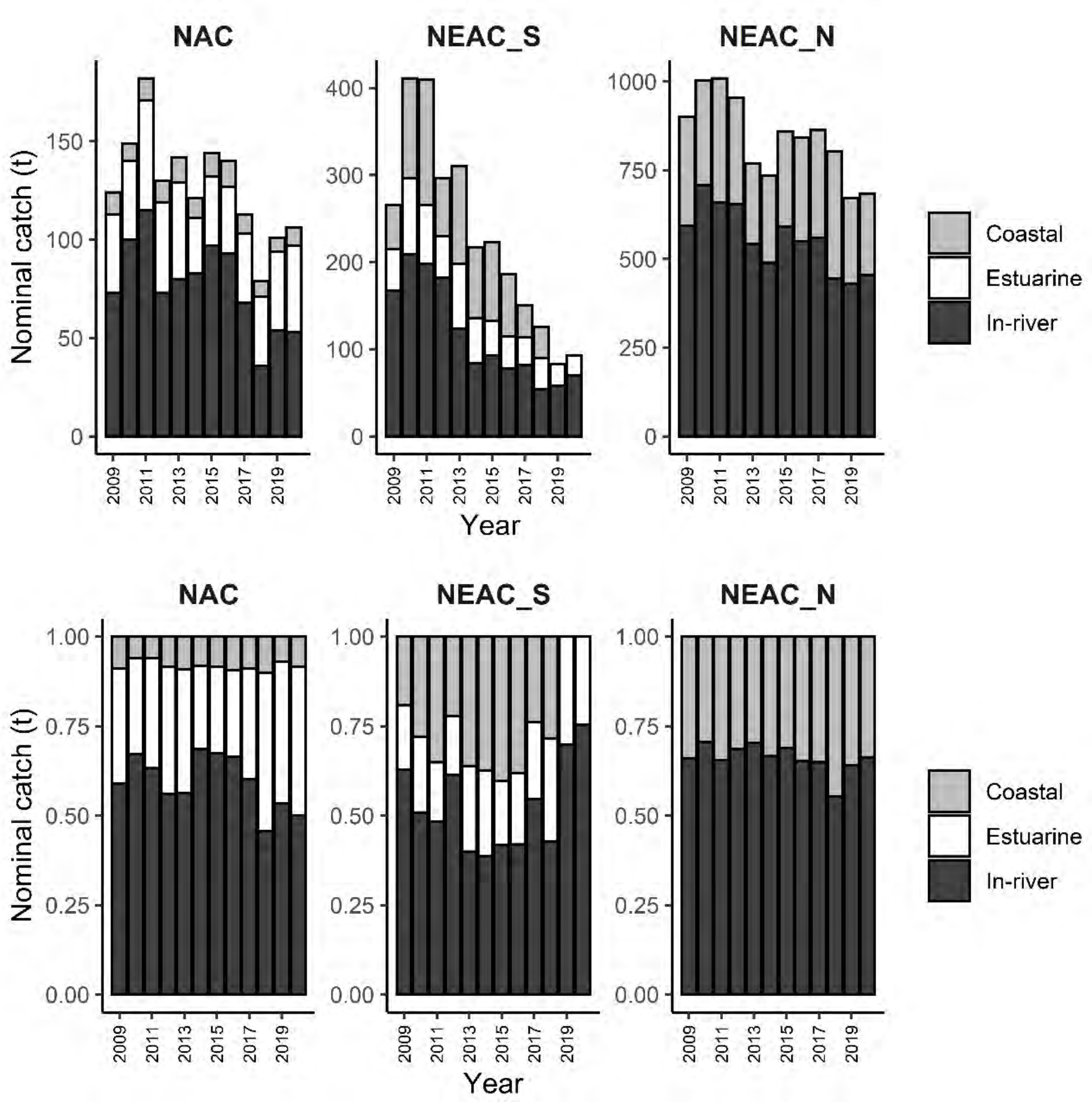


Figure 2.1.1.3. Top panel - Nominal catches (tonnes round fresh weight) taken in coastal, estuarine and in-river fisheries for the NAC area (2009–2020) and for NEAC Northern (NEAC_N) and Southern (NEAC_S) areas (2009–2020). Bottom panel - Percentages of nominal catch taken in coastal, estuarine and in-river fisheries in each commission area, 2009–2020. Note that y-axes in the top panel vary.

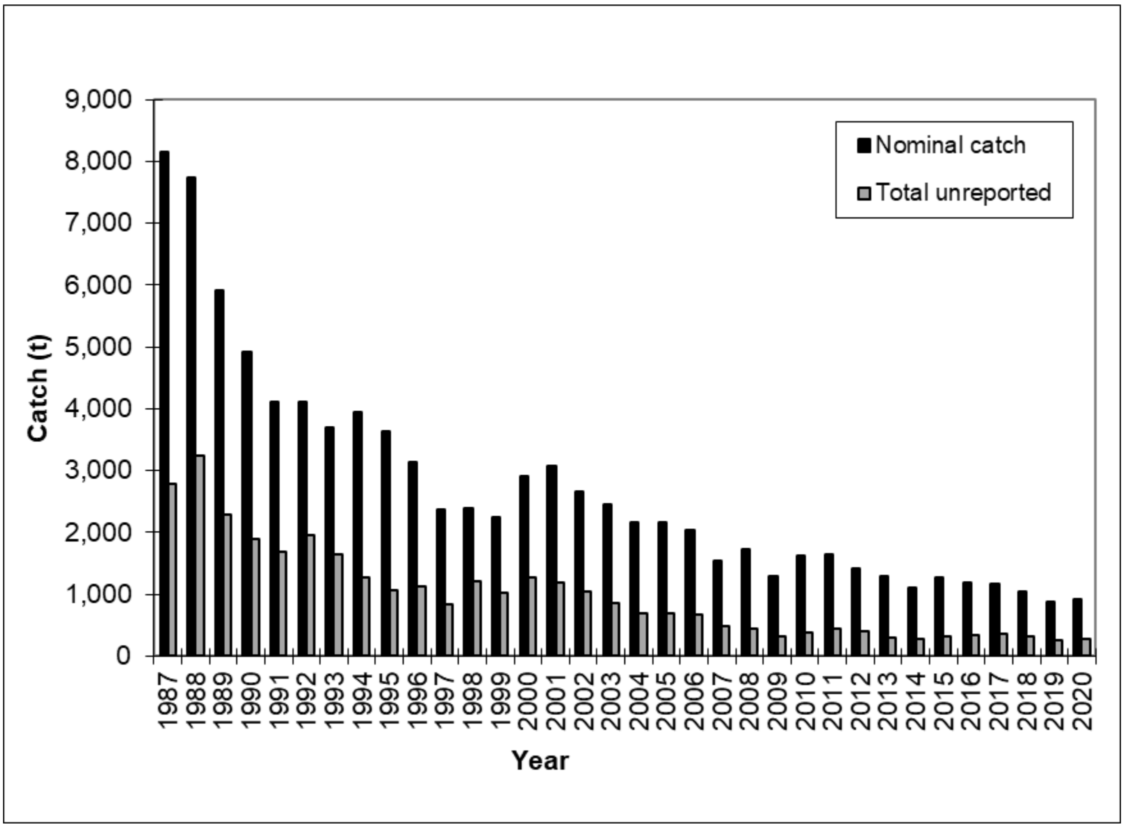


Figure 2.1.3.1. Nominal North Atlantic salmon catch (tonnes round fresh weight) and unreported catch (tonnes round fresh weight) in NASCO Areas, 1987–2020.

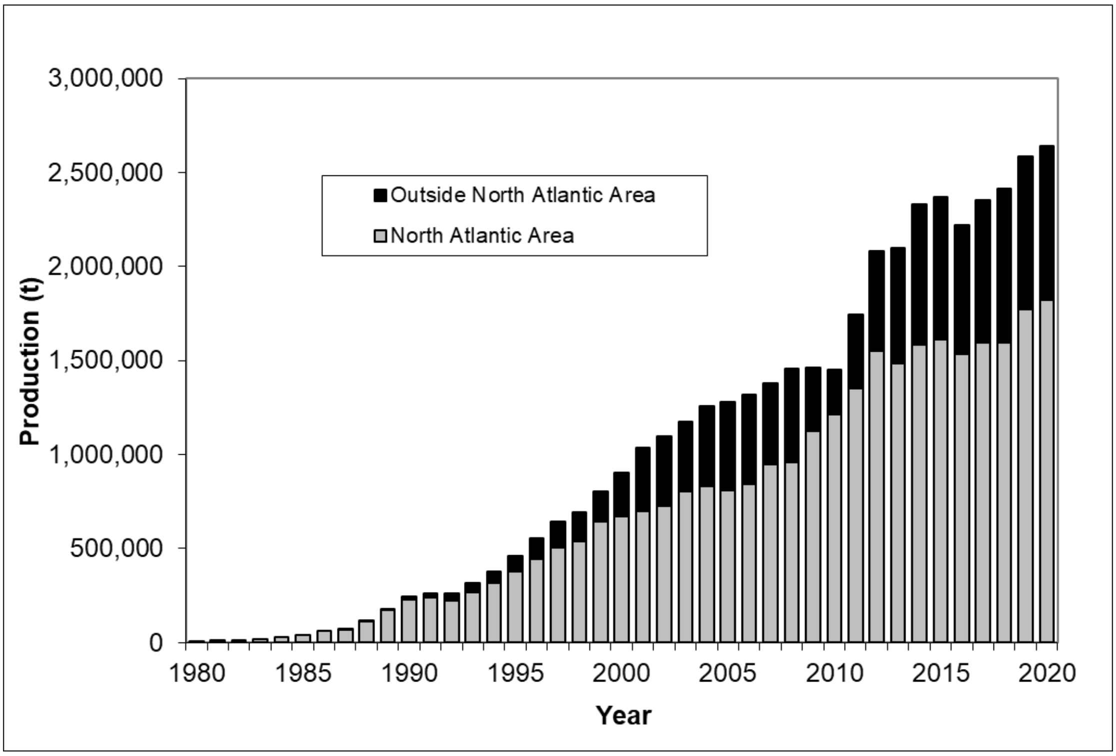


Figure 2.2.1.1. World-wide farmed Atlantic salmon production (tonnes round fresh weight) 1980–2020. Note no data available for USA West coast production at time of writing.

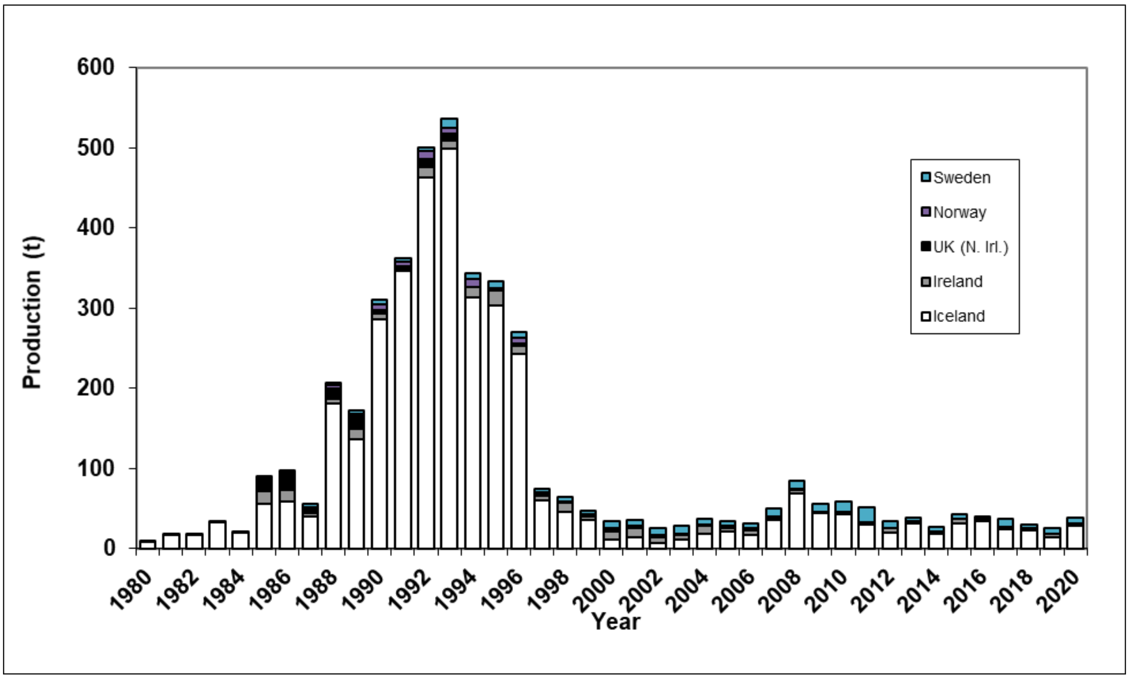


Figure 2.2.2.1. Production of ranched salmon (tonnes round fresh weight) in the North Atlantic, 1980–2020.

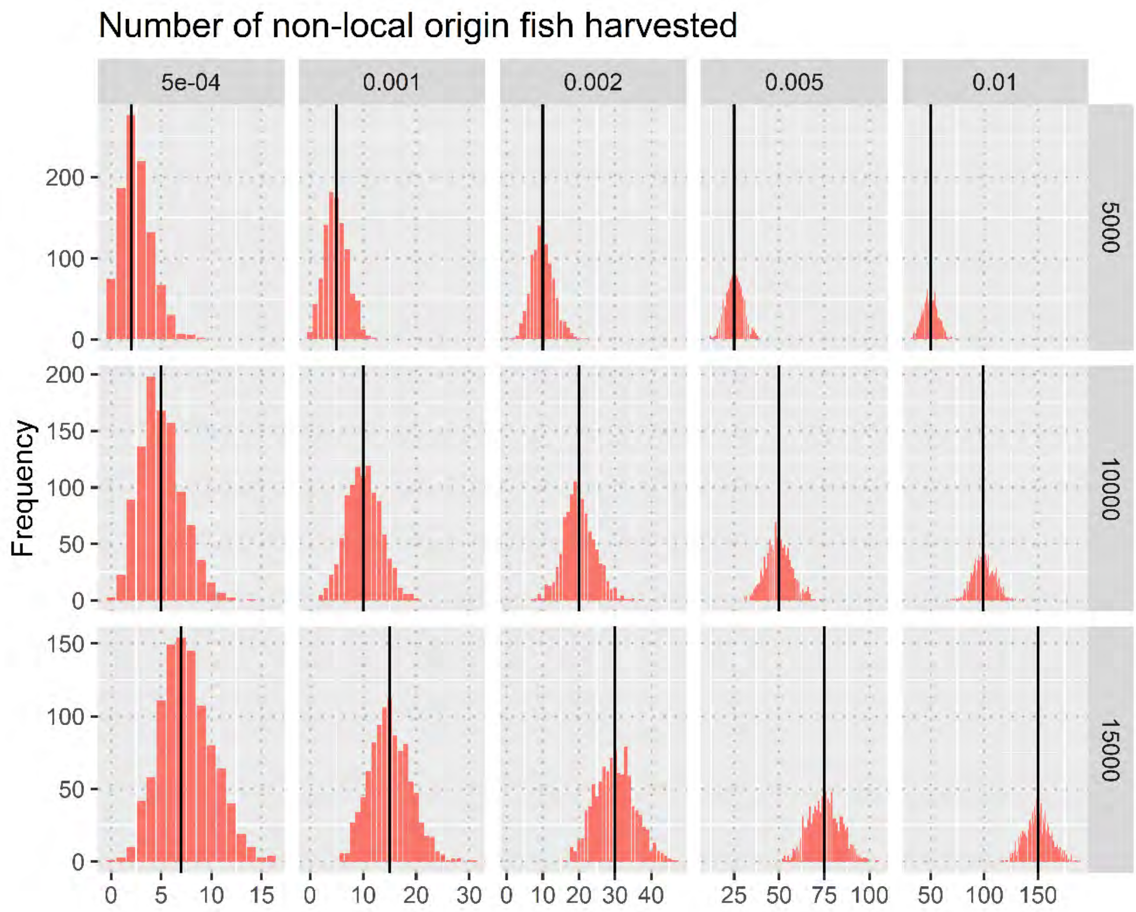


Figure 2.3.4.1. Simulated number of non-local origin fish in the catches for different proportions of non-local origin fish in the pool of fish being exploited (columns) and different levels of total catch (rows). The distribution of catches for each combination of proportions non-local and total catch is derived assuming a Binomial distribution defined by total catch and proportion non-local origin. The median of the distributions is shown as the vertical line in each panel.

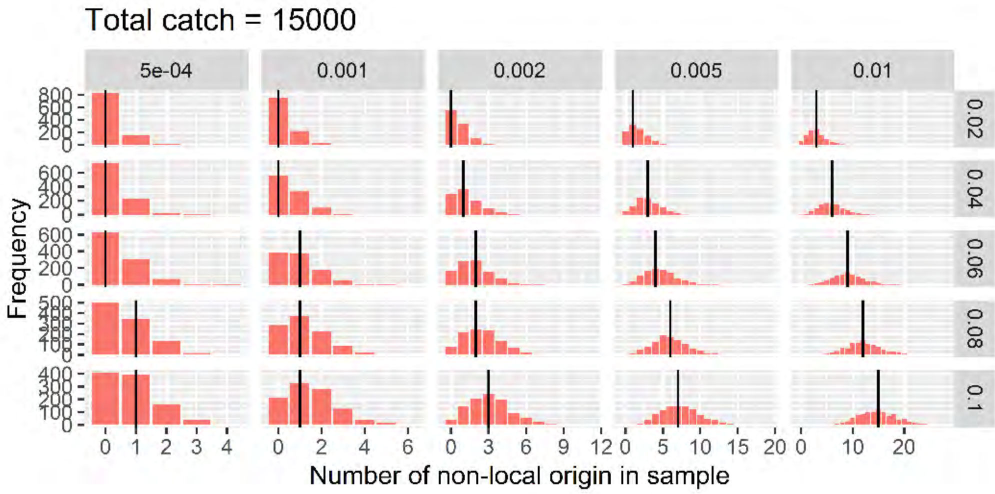


Figure 2.3.4.2. Simulated number of non-local origin fish in the samples from the fishery with a catch level of 15 000 fish, different proportions of non-local fish in the pool of fish exploited (columns) and proportions of the catch sampled (rows). The distributions of non-local origin salmon in the samples are derived assuming a Hypergeometric distribution defined by total catch of non-local origin, total catch of local origin (conditioned by total catch of all origin and proportion non-local origin in the pool of fish) and the number of samples collected (conditioned by total catch and proportion of catch sampled). The median of the distributions of non-local origin samples is shown as the vertical line in each panel.

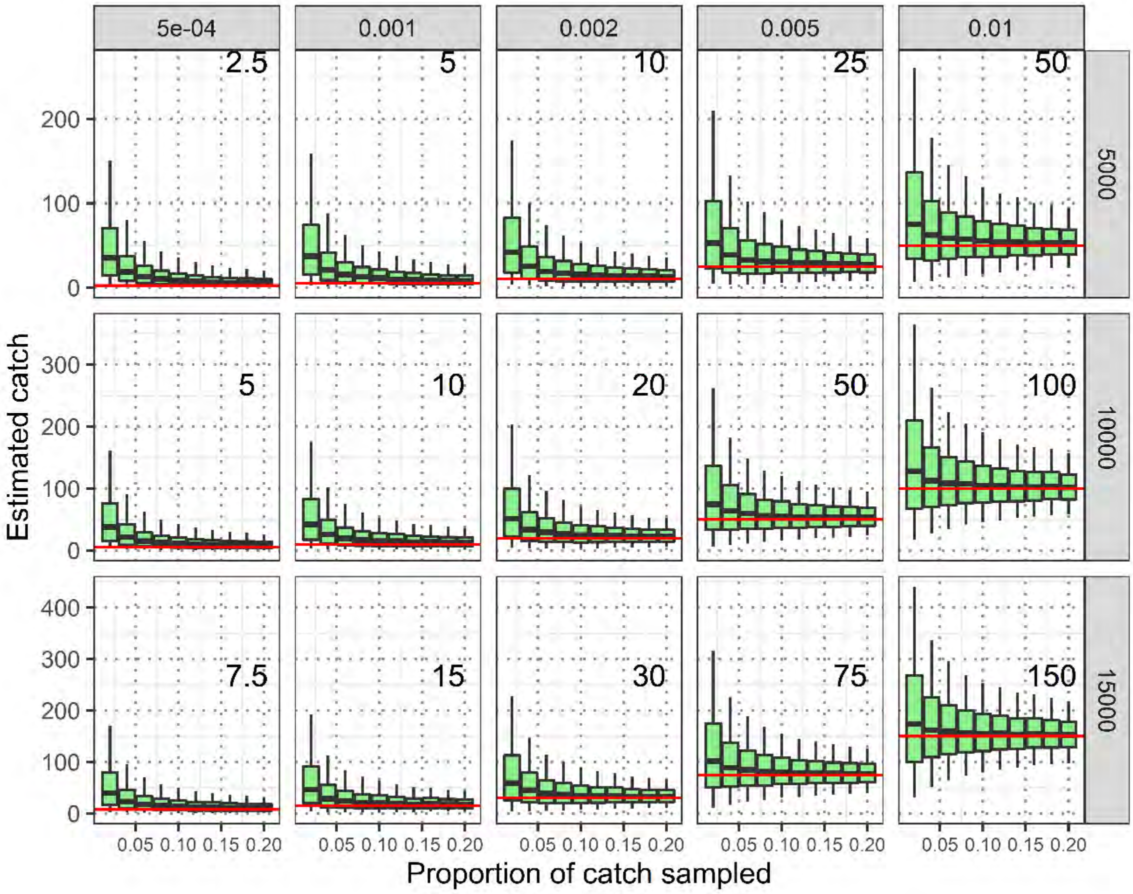


Figure 2.3.4.3. Posterior distribution summaries from the catch estimation process for fish of non-local origin based on the proportion of the fishery catch sampled (2% to 20%) for three levels of catch (rows, number of fish) and the proportion of non-local origin fish in the pool of fish (columns). The boxplots show the median (horizontal line in each box), the interquartile range (shaded rectangle) and the 5th to 95th percentile range (vertical line). The horizontal red line and the text number in each panel is the true catch of non-local origin salmon based on the product of total catch and proportion non-local origin fish which is used to simulate the sampling process.

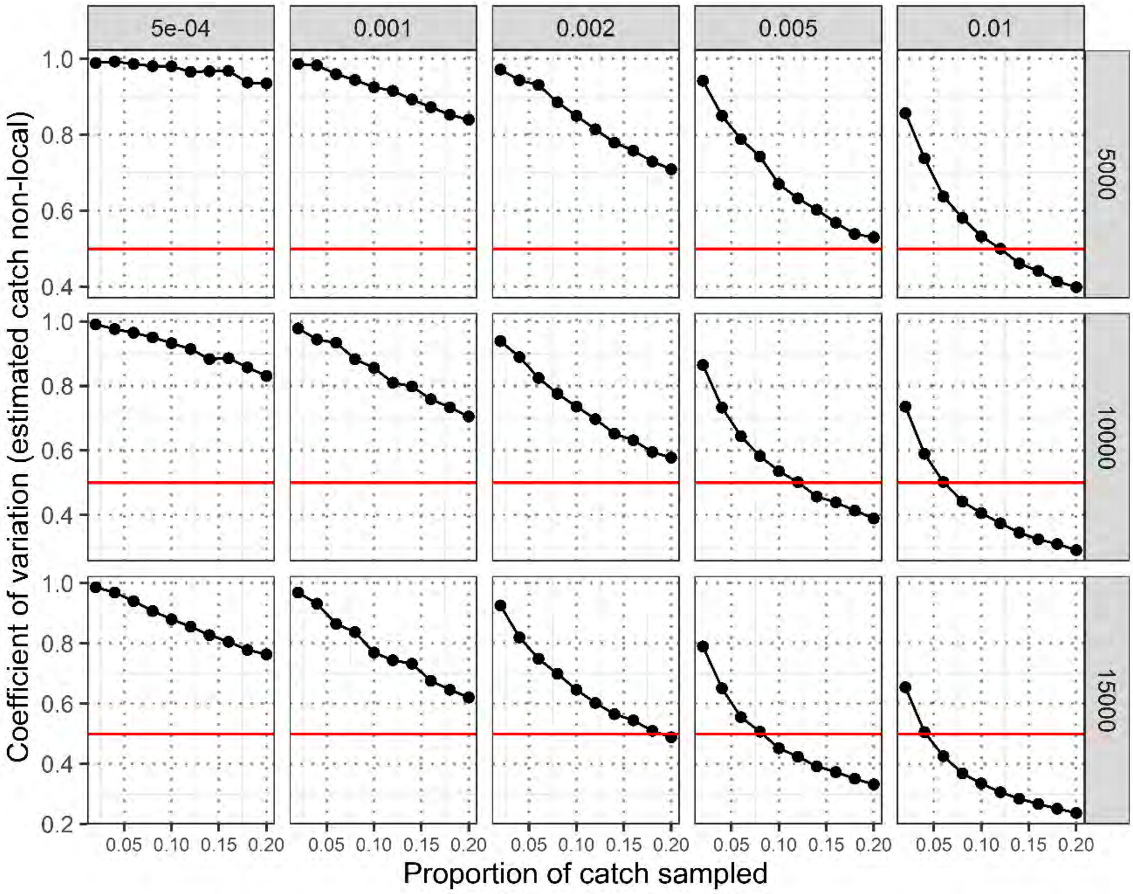


Figure 2.3.4.4. Coefficient of variation of the estimated catch of non-local origin fish relative to the sampling design (proportion sampled) for different values of total catch (rows) and different proportions of non-local origin fish in the pool of fish exploited (columns).

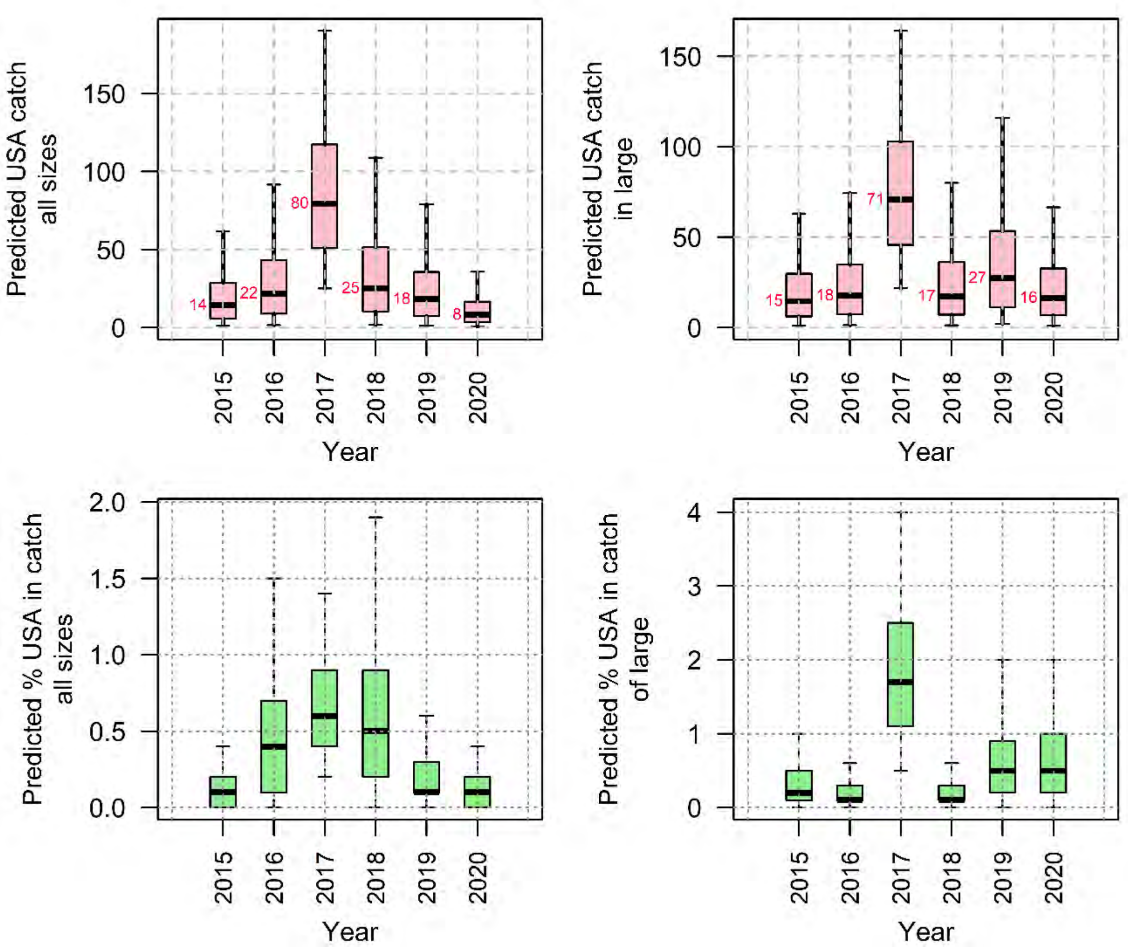


Figure 2.3.4.5. Posterior distributions of the estimated catches of USA origin salmon (top row) and the estimated percentage USA origin salmon in the fishery (bottom row) for all size groups of catches of Atlantic salmon (left column) and large salmon only (right column). The boxplots show the median (horizontal line in each box), the interquartile range (shaded rectangle) and the 5th to 95th percentile range (vertical line). The median of the posterior distribution of the estimated catch is shown next to each boxplot in the upper row.

3 Northeast Atlantic Commission area

3.1 NASCO has requested ICES to describe the key events of the 2020 fisheries

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 Wales (UK England & Wales) in late 2019 came into force in January 2020 and have substantially reduced the exploitation of salmon in 2020. The measures include mandatory catch and release of salmon in all rod and net fisheries across Wales, angling method restrictions (e.g. the number, size and type of hooks), and revised start and finish dates for net fishing seasons.

The COVID-19 pandemic variably affected salmon fisheries in NEAC countries in 2020. These impacts are summarised in Section 2.3.1.

3.1.3 Gear and effort

No significant changes in gear type used were reported in 2020, 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 2020, there were small increases in the numbers of both bagnets and bendnets from the previous year. The number of gear units in the coastal fishery in the Archangelsk region, Russia, has been relatively stable throughout the time-series with only a few years of large deviation from the average of 65 units and in 2020 the number was below the average with 41 units. 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 2020 with only 22 units, which is almost 60% less than the previous five-year and ten-year means.

The numbers of gear units licensed in UK (England & Wales) and Ireland (Table 3.1.3.1) were among the lowest reported in the time-series. In Ireland, a total of 78 licences for commercial gear units were issued which was one more than the previous year. In UK (England & Wales), licences were only issued for sea trout fishing and therefore no fishing for salmon took place in 2020 following the introduction of the National Salmon and Sea Trout Protection byelaws in 2019. In UK (Scotland) the numbers of fixed engines and net and cobles were the lowest in the time-series 2019 with no recorded change in 2020. 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 (17) since 2014, with similar numbers of commercial nets in freshwater for the last four years. No data was available for France at the time of the Working Group meeting.

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 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 2020, 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-series, with a decrease in 2020 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 2020 (778 t) was slightly higher than the updated catch for 2019 (755 t) and 19% and 29% 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 abundance. The provisional total nominal catch in Northern NEAC in 2020 (685 t) was higher than the updated catch for 2019 (671 t) but lower than the previous five-year and ten-year means (808 t, 851 t, respectively). In the Southern NEAC area the provisional total nominal catch for 2020 (93 t) was higher than the updated catch for 2019 (83 t) but was 39% and 61% below the previous five-year and ten-year means respectively. The greatest reductions in catches in Southern NEAC since 2018 were observed in UK (England & Wales) where the catch in 2019 (5 t) was only 12% of the catch in 2018 (42 t), and the 2020 catch was even lower, 3 t. The reduction is largely a result of 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 until 2020. 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 continues to show a steady decline over the last 15 years from over 1000 t to currently below 100 t. The catch in the Northern NEAC area declined over the time-series, although this decrease was less distinct than the reductions noted 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, and then increased to over 1600 t in 2001. Catch in the Northern NEAC area has exhibited a downward trend since and has been consistently below 1000 t since 2012. Thus, the catch in the Southern NEAC area, which comprised around $^2/_3$ 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 $^1/_5$ 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. 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. CPUE may be affected by increasing rates of catch and release in rod fisheries.

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

In the Northern NEAC area the CPUE for the commercial coastal net fisheries in the Archangelsk area, Russia, showed a general decrease (Figure 3.1.5.1 and Table 3.1.5.2). Russian river fisheries showed 2020 CPUE figures 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 trends show an 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 3.1.5.1). After the major change in fishery regulation on the Teno, the 2017 figures were clearly higher than in the previous year and the five-year means but were at earlier lower levels again in 2018-2020 (Table 3.1.5.1). For the River Näätämöjoki, CPUE figures for 2020 were lower than in the previous year and the long-term and five-year means. A general increasing trend was observed for the CPUE in the Norwegian net fisheries (Figure 3.1.5.1), but the figures in 2020 were mostly lower than in the previous year or the long-term means for both bag nets and bend nets (Table 3.1.5.6).

In the Southern NEAC area, UK (England & Wales) closed all net fisheries for 2019 and 2020 (except in Wales in 2019), and updated CPUE figures have not been calculated (Table 3.1.5.3). The CPUE for the net and coble fisheries in UK (Scotland) show a general decline over the time-series (Figure 3.1.5.1). After an increase in 2018, the CPUE value decreased substantially in 2019 and has stayed at the same level in 2020 (Table 3.1.5.5). The CPUE for the fixed engine fisheries has shown a slight increase since 2010, but in 2016–2020 there was no information on effort due to changes in fishery regulations (Table 3.1.5.5). The CPUE values for rod fisheries in UK (England & Wales) show a general positive trend (Figure 3.1.5.1) and an increase in 2020 from the previous year (Table 3.1.5.4). In France, the CPUE for rod fisheries shows an overall decline over the time-series (Figure 3.1.5.1), and the 2020 figure was lower than in the previous year and the long-term means (Table 3.1.5.1).

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 1987–2020, especially so for Sweden. 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 65%, range 61% to 71%), but has fallen in more recent years (2001–2020) to 59% (range 53% to 67%), 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 2001–2020, 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 61% (range 49% to 67%) in 1987–2000 and 55% (range 44% to 66%) in 2001–2020. 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 2020 was again generally low in most countries. 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 2020 was reported to be approximately 43 000 fish (provisional figure), substantially down from the previous year (287 000). 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 2020 was the lowest in the time-series (2%), and the proportion in samples taken from Norwegian rivers in autumn (3%), was also the lowest value in the time-series. No data are available for the proportion of farmed salmon in coastal fisheries in Norway. A small number of escaped farmed salmon (seven) was also reported from catches in Icelandic rivers in 2020. Three of these, caught in rod fisheries, have been confirmed to be of farmed origin by genetic analysis, while four additional fish caught in a monitoring survey have yet to be confirmed as farmed. A small number (nine) of farmed salmon were also reported in catches by all methods from UK (England & Wales).

The release of smolts for commercial ranching purposes ceased in Iceland in 1998 but ranching for rod fisheries in two Icelandic rivers continued in 2020. Icelandic catches have traditionally been split into two separate categories, wild and ranched (Table 2.2.2.1). In 2020, 28 t of catch were reported as ranched salmon in contrast to 42 t harvested as wild. Similarly, Swedish catches have been split into two separate categories, wild and ranched (Table 2.2.2.1). In 2020, 7 t of catch were reported as ranched salmon in contrast to 7 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

The Working Group has previously reported on catches of Russian salmon in northern Norway based on results from the Kolarctic Salmon project (Kolarctic ENPI CBC programme 2007–2013) (ICES, 2020). No new information was presented to the Group in 2021.

The 2020 meeting of the Working Group on Atlantic salmon in Finnmark County and the Murmansk Region, established under the Memorandum of Understanding between the Ministry of Climate and Environment (Norway) and the Federal Agency for Fishery (the Russian Federation), was postponed from August due to COVID-19 and rescheduled for August 2021.

In 2020 the Kolarctic ENI CBC project CoASal "*Conserving our Atlantic salmon as a sustainable resource for people in the North; fisheries and conservation in the context of growing threats and a changing environment* (KO4178)" was started. The project aims to document and examine the effect of the new coastal salmon fishery regulations, study the effects of growing threats Atlantic salmon populations face today with climate change, growing cage culture industry and emerging diseases. Project partners are from Norway: the County Governor of Troms and Finnmark (Lead Partner) and Institute of Marine Research, from Russia: Polar branch of VNIRO (PINRO), from Finland: University of Turku, Biodiversity Unit and from Sweden: Swedish University of

Agricultural Sciences. The project will be implemented in the period from January 2020 to September 2022. The project is funded through EU's Kolarctic ENI CBC programme, national funding and funding from the partners. The project follows up and builds on the results from the "Kolarctic salmon (KO197)" project (2011–2013).

3.1.9 Exploitation indices of NEAC stocks

Exploitation rates have been plotted for 1SW and MSW salmon from the Northern NEAC (1983 to 2020) and Southern NEAC (1971 to 2020) 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 1980's 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 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 45% in 2020, which was over the previous five-year (41%) and ten-year (41%) means. Exploitation on 1SW fish in the Southern NEAC complex was 7% in 2020, which was lower than the previous five-year (9%) and the ten-year (10%) 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), with a notable sharp decline in 2008. Exploitation on MSW salmon in the Northern NEAC area was 43% in 2020, which was at the same level as the previous five-year mean (43%) and the ten-year mean (43%). Exploitation on MSW fish in Southern NEAC was 3% in 2020, which was clearly lower than the previous five-year (7%) and ten-year (9%) means.

The rate of change of exploitation of 1SW and MSW salmon in NEAC countries over the available time periods is shown in Figure 3.1.9.2. This was 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, while the largest rate of reduction has been for MSW salmon in Iceland (Northeast). The Southern NEAC countries have also shown a general decrease in exploitation rate (Figure 3.1.9.2) on both 1SW and MSW components, except for 1SW salmon in France where exploitation for 1SW salmon has increased over the time-series. 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.

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 & Wales), UK (Northern Ireland), UK (Scotland), 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 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).

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 1st 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 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. Progress with estimating CLs was made for eleven more rivers in 2019 and four more rivers in 2020. The 16 rivers that now have CL estimates are all large salmon fishing rivers, mostly in West Iceland, that contribute around 40% 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.

3.3 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 2020, the following changes were made to the national/regional input data for the model:

UK (Northern Ireland): Changes to the UK (Northern Ireland) run-reconstruction model inputs included the implementation of an updated CL for the Loughs Agency Area (River Foyle). The previously used CL was derived from the stock–recruitment relationship for the nearby River Bush and estimated to be around 27 million eggs. A recent publication by Honkanen *et al*. (2018) provided a new stock–recruitment relationship specific to the River Foyle. Using this newly available data, an updated CL for the River Foyle was calculated at 66.5 million eggs.

UK (Scotland): Several changes were made to the UK (Scotland) run-reconstruction model inputs to incorporate existing river-specific CLs and to re-specify the distribution of uncertainty surrounding unreported catches and the correction factor applied to declared rod catches to estimate returns (the latter is detailed in ICES, 2018).

Progress in setting river-specific CLs for the UK (Scotland) was detailed in ICES (2019, 2020). Briefly, Bayesian hierarchical models were developed to derive CLs using 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. In 2021, the sums of individual river-level CLs at the regional scale (East and West) were provided for implementation within the run-reconstruction and PFA forecast models.

The uncertainty in unreported catch was previously specified by a normal distribution N(0.1, 0.05). To prevent values less than zero being sampled, the distribution was re-specified as U(0.1 – 0.05, 0.1 + 0.05). For similar reasons, the correction factor applied to declared rod catches (retained and released) to estimate returns was re-specified from a normal distribution to a lognormal distribution.

West Greenland: Due to issues caused by the COVID-19 pandemic, the 2020 data, except for reported harvest in metric tonnes, could not be obtained. These were data on fish wet mass to estimate the number of fish harvested, the proportion of 1SW fish to allocate harvest to sea age, and the number of genetic samples to allocate harvest between NAC and NEAC. To mitigate this shortcoming, the 2020 data for fish wet mass and the proportion of 1SW fish were taken from averages over the last five years. For the number of genetic samples, the five-year averages were divided by 15 to better capture the five-year variation in the proportion of fish originating from NAC vs NEAC in the West Greenland fishery. For more information, see Section 5.2.

3.3.3 Changes to the NEAC PFA run–reconstruction model

UK (England & Wales): The number of returns for 2020 were based on total rod catch multiplied by a correction factor that included an estimate of uncertainty. Previously, correction factors and uncertainty estimates were derived from both total rod and net catch, however, there was no net catch in 2020 due to the closure of the fishery in UK (England and Wales). The exploitation rates for 2020 were derived from estimated returns and retained rod catch (reported and unreported) using the same procedure as last year.

UK (Northern Ireland): The updated CL for the Loughs Agency Area (River Foyle) was implemented in the run-reconstruction model. Although the updated CL did not change the model outputs, the associated changes in biological reference points modified the resulting stock status estimates and catch options.

UK (Scotland): To accommodate revisions to the data inputs described above, the sums of individual river-level CLs at the regional scale were used in the derivation of biological reference points. The updated CLs did not affect the run-reconstruction model outputs. However, the changes in biological reference points modified the resulting stock status estimates and catch options. Uniform distributions were implemented for uncertainty in unreported catch.

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 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 also 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. In this regard, changes to the data inputs for UK (Scotland) resulted in alterations to the PFA and spawner time-series, and changes to the data inputs for UK (Northern Ireland) and

UK (Scotland) resulted in changes in their CL and SER values and those for the Southern NEAC stock complex.

Status of stocks is assessed relative to the probability of exceeding CLs, or for PFA, 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 (i.e., above the SER; Section 1.5; Figure 3.3.4.2). Similarly, 1SW and MSW stocks in the Southern NEAC complex were considered to be at full reproductive capacity prior to the commencement of distant-water fisheries in the latest available PFA year (Figure 3.3.4.2), although this is due, at least in part, to changes in the UK (Northern Ireland) and UK (Scotland) SERs and CLs (section 3.2).

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. The 1SW spawners in the Northern NEAC stock complex have been at full reproductive capacity throughout the time-series. 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 stocks have, however, been at full reproductive capacity prior to the commencement of distant-water fisheries for all but three and one years, respectively (Figure 3.3.4.2). The 1SW spawners in the Southern NEAC stock complex have been at risk of suffering reduced reproductive capacity or suffering reduced reproductive capacity for six of the most recent 10 years (Figure 3.3.4.2). In opposite, MSW spawners in the Southern NEAC stock complex have been at risk of suffering reduced reproductive capacity or suffering reduced reproductive capacity for most of the time-series, although they have been at full reproductive capacity for all of the most recent ten years (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 Tana/Teno (Finland & Norway) and Russia and non-maturing stock in Tana/Teno which were suffering reduced reproductive capacity (Figure 3.3.4.3). Returning and spawning 1SW and MSW stocks in Sweden and Norway were at full reproductive capacity in the most recent assessment. However, both 1SW and MSW returns and spawner stocks in the River Teno/Tana (Finland & Norway) and in Russia were suffering reduced reproductive capacity, except for MSW returns in Russia which were at full reproductive capacity (Figures 3.3.4.4 and 3.3.4.5). In addition, 1SW spawners in Iceland were at risk of suffering reduced reproductive capacity.

In Southern NEAC, maturing and non-maturing stocks in UK (Northern Ireland), Ireland and France were suffering or at risk of suffering reduced reproductive capacity both prior to the commencement of distant-water fisheries and at spawning (Figures 3.3.4.3–3.3.4.5). In contrast, UK (Scotland) maturing and non-maturing stocks were at full reproductive capacity both prior to the commencement of distant water fisheries and at spawning. In UK (England & Wales), the maturing stock was suffering reduced reproductive capacity both prior to the commencement of distant water fisheries and at spawning, whereas the non-maturing 1SW stock and MSW spawners were at full reproductive capacity throughout (Figures 3.3.4.3–3.3.4.5).

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, after fisheries.

- For the River Teno (Finland/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 CL). No stocks met CL prior to 2013. Since then, CL attainment has fluctuated within a range of 20% to 40%. In 2020, including the main stem, three out of 15 (20%) assessable stocks attained 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 177 stocks are assessed since 2009. A mean of 64% of river stocks have met CL over the time-series. Since 2015 ≥ 74% of assessed stocks have met CL with 75% attainment in 2019 (data are pending for 2020).
- Since 1999, CLs have been established for 85 river stocks in Russia (Murmansk region). Eight of these have been annually assessed for CL attainment, of which 88% have consistently met their CL. In 2020, two were assessed with one of these meeting CL.
- Sweden established CLs in 2016 for 23 stocks which rose to 24 stocks since 2017. Eight of the 21 stocks (38%) met CL in 2016. A mean of 28% of assessed stocks have met CL since then with 25% attaining CL in 2020.
- In France, CLs were established for 27 river stocks in 2011, rising to 37 since 2018. A mean of 6% of assessed stocks have met CL over the time-series with 3% attaining CL in 2020.
- Ireland established CLs for all 141 stocks in 2007, rising to 144 since 2020 to include sub-catchments associated with hydrodams. The mean percentage of stocks meeting CLs 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 27% in 2020.
- UK (England & Wales) established CLs in 1993 for 61 rivers, increasing to 64 from 1997 with an overall mean of 43% meeting CL over the time-series. In 2020, 33% of assessed stocks met CL which is an increase on the two preceding years.
- 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 42% have met their CLs over the time-series. A downward trend was evident from 2016 (76%) to 2019 (33%). However, 69% of assessed stocks attained CL in 2020, albeit with less systems assessed than preceding years.
- UK (Scotland) have 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 51%. In 2019, the most recent reporting year available, 44% of assessment groups met CL, an increase of 14% on the preceding year.

- No river-specific CLs have been established for Denmark, Germany and Spain. Iceland has set provisional CLs for all salmon producing rivers and continues to work towards finalising an assessment process for determining CL attainment.

3.3.6 Return rates

An overview of the trends of 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 2015–2019, inclusive) and smolt to 2SW (smolt years 2014-2018, 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; and (3) 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 is unchanged compared to the previous five years, and as 2SW returns has decreased over the same period from 2.24% to 1.18%. 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 2.16% to 2.44% and as 2SW returns decreasing from 1.38% to 0.40%.

In Southern NEAC, the pattern in five-year mean return rate of wild smolts as 1SW returns compared to the previous five years was mixed, with three rivers decreasing and five rivers increasing. The largest decrease was on the River Dee (UK (England & Wales)) from 2.15% to 1.00%, and the largest increase was on the River Tamar (UK (England & Wales)) from 2.33% to 4.54%. The pattern in hatchery smolts returning as 1SW compared to the previous five years was also mixed, with three rivers increasing and six rivers decreasing. Five-year mean return rates of wild smolts as 2SW returns decreased compared to the previous five years in all but the River Dee, which increased from 0.95% to 3.20%, and the largest decrease was on the River Bush (UK (Northern Ireland)) from 1.10% to 0.45%.

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 estimated 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). To account for variation due to the number of contributing experimental groups, mean annual return rates were estimated using 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 reported annual return rates were used to estimate the mean annual return rates, i.e. there was no restriction on the numbers of years reported to ensure the maximum number of rivers could contribute. 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 wild smolts have stabilised since 2010, and from hatchery smolts have increased since 2005 (Figure 3.3.6.2). Rates of 2SW returns from hatchery smolts to Northern NEAC are highly variable, but have continued to decline in 2019, especially for hatchery smolts. 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 suggest that abundance is strongly influenced by factors in the marine environment.

3.4 PFA forecasts

In 2021, the Working Group ran forecast models for the Southern NEAC and Northern NEAC complexes independently, and for countries within each stock complex. The model and its application are described in detail in Section 3.2.2 of the Stock Annex.

3.4.1 Description of forecast model

The stock complex and country scale models follow the same basic structure, differing in the scale over which the data are aggregated. In the country scale models, parallel data streams and analyses for each of the countries comprising the stock complex are modelled. These data are aggregated in the stock complex models.

The PFA is modelled within a Bayesian framework using the summation of lagged eggs from 1SW and MSW fish corresponding to a PFA year together with an exponential productivity parameter inferred from the proportionality between the log of lagged eggs and PFA. The maturing PFA and the non-maturing PFA recruitment streams are subsequently calculated from the inferred proportion of PFA maturing parameter for each year. Both the productivity parameter and the proportion maturing parameter are modelled using a random walk.

For the stock complex models, catches of salmon in the West Greenland fishery (as 1SW non-maturing salmon) and at Faroes (as 1SW maturing and MSW salmon) are introduced as covariates and incorporated directly within the inference and forecast structure of the model. For the country disaggregated model, country-specific catch proportions at Faroes, lagged eggs and returns of maturing and non-maturing components are used.

Forecasts for maturing and non-maturing stocks were derived for each stock complex (and country) for five years, from 2020 to 2024. Risks were defined each year as the posterior probability that the PFA would be above the age and stock complex-specific Spawner Escapement Reserves (SERs). For illustrative purposes, risk analyses were derived based on the probability that the maturing and non-maturing PFAs would be greater than or equal to the maturing and non-maturing SERs under the scenario of no exploitation, for both the northern and southern complexes.

3.4.2 Results of the NEAC stock complex Bayesian forecast models

The trends in the posterior estimates of PFA for both the Southern NEAC and Northern NEAC complexes match the PFA estimates derived from the run-reconstruction model (Section 3.3.4). From these, the productivity parameters (*a*) and the proportions maturing (*p.PFAm*) are derived and forecasts for the time period 2020 to 2024 modelled.

For the Southern NEAC stock complex, the proportion of maturing 1SW parameter shows a declining trend from 1996 to present with the productivity parameter showing a general decline over the entire time-series (Figure 3.4.2.1). 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 (Section 3.3.4).

- The median estimate of the maturing PFA stock component is forecast to fall below the SER for 2022 and 2023, however remains above for 2020, 2021 and 2024 (Table 3.4.2.1).
- The median non-maturing PFA stock component is forecast to remain above the SER for all forecast years.
- These PFA dynamics mirror the forecast of total lagged eggs which decline from 2020 to 2023, reaching the lowest level on record, before rising again in 2024.

In the Northern NEAC stock complex, the parameter for proportion maturing is generally lower in the latter half of the time-series (Figure 3.4.2.2). The productivity parameter is highly variable but has shown a general decline over the time-series although not as pronounced as for the Southern NEAC stock complex.

- In the Northern NEAC stock complex (Figure 3.4.2.2), the median PFA for maturing stocks is forecast to remain above SER from 2020 to 2024, with a small decline for the last two years of the forecast. The probability of exceeding the SER reaches a low of 0.87 in 2024 (Table 3.4.2.1).
- PFA for the non-maturing stock complex is forecast to remain stable for 2020 and 2021 and decline from 2022 to 2024. However, the lowest forecast probability of exceeding the SER is still large at 0.93 in 2024.

3.4.3 Results of the NEAC country level Bayesian forecast models and probabilities of PFAs attaining SERs

Figures 3.4.3.1 to 3.4.3.11 show country level maturing and non-maturing PFA forecasts, with the probabilities of PFAs exceeding the SERs detailed in Table 3.4.3.1 for Southern NEAC countries and Table 3.4.3.2 for Northern NEAC countries.

Of note in the forecasts of Southern NEAC countries:

- France: the forecast (2020 to 2024) median maturing PFA is consistently below the SER. With the exception of 2023, the median non-maturing PFA is above SER.
- Ireland: for both maturing and non-maturing stocks, the median PFA is below the SER for forecasted years (2020 to 2024).
- UK (Northern Ireland): for both maturing and non-maturing stocks, the median PFA is below the SER for forecasted years (2020 to 2024).
- UK (England & Wales): the median estimate for maturing PFA is forecast to remain below the SER between 2020 and 2024, while the median non-maturing PFA is forecast to remain above the SER, with probabilities of exceeding SER above 0.9.
- UK (Scotland): the general decline in maturing and non-maturing PFA is forecast to continue, however, probabilities of attaining SER are high, with lows of 0.7 and 0.63 for the maturing and non-maturing stocks, respectively (Table 3.4.3.1).
- Iceland (south/west regions): maturing and non-maturing PFA are both forecast to decline, with the median maturing PFA falling below SER in 2024. Proportion maturing is high compared to levels seen in the early 1980s.

Of note in the forecasts of Northern NEAC countries:

- Russia: PFA forecasts show a continuation of the general decline in the time-series, reaching lows in probability of attaining SER of 0.27 for maturing stock and 0.40 for non-maturing stock in 2023. Lagged eggs for the non-maturing component are forecast to sharply decline between 2020 and 2022, remaining low in 2023 and 2024.
- Finland: the forecast PFA for maturing and non-maturing stock show slow declines with probability of attaining SER remaining at or below 0.41 for both components.

- Norway: PFA for both stock components are predicted to remain above the SERs with probabilities of attaining SER above 0.91.
- Sweden: PFA for both stock components are forecast to increase between 2020 and 2024. Probability of attaining SER is between 0.65 and 0.84 for maturing PFA and between 0.90 and 0.96 for non-maturing PFA.
- Iceland (north/east regions): maturing and non-maturing PFAs remain generally above the SERs but are forecast to decline between 2021 and 2024. Probabilities of attaining SER ranging between 0.89 and 0.60 for the maturing component and between 0.80 and 0.56 for the non-maturing component.

3.5 Catch options or alternative management advice

3.5.1 Catch advice for Faroes

The Faroes risk framework (ICES, 2013) has been used to evaluate catch options for the Faroes fishery in the 2021/2022, 2022/2023 and 2023/2024 fishing seasons (October to May). The assumptions and data used in the catch options assessment are described in the Stock Annex. The procedure used for estimating the stock composition was as described by ICES (2015); all other input data were as described by ICES (2013).

The Working Group applied the risk framework model to the four management units previously used for the provision of catch advice (maturing and non-maturing 1SW recruits for Northern and Southern NEAC) and also for the two age groups in ten NEAC countries (i.e. 20 management units). Germany, Spain and Denmark are not currently included in the PFA or catch advice assessments. North American fish form part of the catch and are accounted for in the catch advice for NEAC. The risk framework estimates the probability that the PFA of maturing and non-maturing 1SW salmon in each of the management units will meet or exceed their respective SERs at different catch levels (TAC options). ICES have advised that the management objective should have a greater than 95% probability of meeting or exceeding the SER in each management unit. As NASCO has not yet adopted a management objective, the advice tables provide the probabilities for each management unit and the probabilities of simultaneous attainment of all SERs for each TAC option.

As an example, a 20 t TAC option would result in a catch of about 5000 fish in the Faroes. The great majority (>97.5%) of these would be expected to be MSW fish. Once the sharing allocation (8.4%) is applied, and the numbers are adjusted for natural mortality to the same seasons as the PFA, this equates to about 650 maturing and 84 000 non-maturing 1SW fish equivalents assumed to be caught by all fisheries. The maturing and non-maturing 1SW components are split according to the new catch composition estimates, and these values are deducted from the PFA values which are then compared with the following SERs (from Table 3.2.1.1):

Northern NEAC maturing 1SW:	174 727 fish
Northern NEAC non-maturing 1SW:	209 236 fish
Southern NEAC maturing 1SW:	553 846 fish
Southern NEAC non-maturing 1SW:	295 582 fish

Note that the Southern NEAC SERs are substantially lower than last year's figures (745 036 and 497 776 for maturing and non-maturing 1SW salmon, respectively). This is largely due implementation of new river-specific CLs for UK (Scotland) that account for approximately 50% of the Southern NEAC PFA. The new CLs are estimated within a Bayesian hierarchical model and represent an improvement over previously used values which were based on the establishment of pseudo stock–recruitment relationships for national stocks (Section 3.3.2). However, the new values are lower than in previous years. In 2021, UK (Northern Ireland) revised the CL for the Loughs Agency area (River Foyle). The updated CL is based on new stock–recruitment data for the River Foyle which is an improvement over the use of the River Bush stock–recruitment relationship on this river, as done previously. The new River Foyle values are higher than in previous years, but this change had a limited effect on the Southern NEAC SERs.

Catch Advice based on Stock Complexes

The probabilities of the Northern and Southern NEAC stock complexes achieving their SERs for different catch options are shown in Table 3.5.1.1 and Figure 3.5.1.1. The probabilities with a zero TAC are the same as the values generated directly by the forecast model (Section 3.4). In the Northern NEAC stock complex, over the forecast period, the non-maturing 1SW component has a high probability (≥95%) of achieving its SER for TACs at Faroes solely for a catch option of ≤20 t in the 2021/2022 season. The maturing 1SW component in the Northern NEAC stock complex and both Southern NEAC stock complex components each have less than 95% probability of achieving their SERs with any TAC option in any of the forecast seasons. Therefore, there are no catch options that ensure a greater than 95% probability of each stock complex achieving its SER.

The slope of the curves in the catch option figures (Figure 3.5.1.1) is chiefly a function of the level of exploitation on the stocks resulting from a particular TAC in the Faroes fishery and the uncertainty in the parameter values used in the model. The relative flatness of some of the risk curves, particularly for the maturing 1SW stocks, indicates that the risk to these management units is affected very little by any harvest at Faroes, principally because the exploitation rates on these stock components in the fishery are very low (Table 3.5.1.2).

Catch Advice based on Countries

The probabilities of the NEAC national maturing and non-maturing 1SW management units achieving their SERs for different catch options are shown in Tables 3.5.1.3 and 3.5.1.4, respectively. The probabilities of the maturing 1SW national management units achieving their SERs in 2021/2022 vary between 22% (UK, England & Wales) and 97% (Norway) for the different countries with zero catch at Faroes. These probabilities decline very little with increasing TAC options, reflecting the expected low exploitation rate on maturing 1SW stocks at Faroes (Table 3.5.1.5). The probabilities are also generally lower for the two subsequent seasons.

The probabilities of the non-maturing 1SW national management units achieving their SERs in 2021/2022 vary between 20% (UK, Northern Ireland) and 99% (Norway) with zero catch allocated for the Faroes fishery and decline with increasing TAC options. The only countries to have a greater than 95% probability of achieving their SERs with catch options for Faroes are Norway (TACs ≤40 t) and UK (England & Wales) (TACs ≤40 t). In most countries, these probabilities are lower in the subsequent two seasons. There are, therefore, no TAC options at which all management units would have a greater than 95% probability of achieving their SERs.

The Catch Options Model indicates that the exploitation rates on national maturing 1SW management units in the Northern and Southern NEAC areas are low (≤0.3% and ≤0.7%, respectively), at TACs up to 200 t (Table 3.5.1.5). Assuming any fishery at Faroes would be operated as in the past, and efforts would be made to minimise catches of 1SW fish, the stocks represented by these management units would be largely unaffected by a fishery. This is not the case for the non-maturing 1SW where exploitation rates can be above 15% (Russia), at TACs up to 200 t (Table 3.5.1.6). It should also be noted that the catch advice assumes that the exploitation rate at Faroes represents only about 8% of the total exploitation of this component of the stocks.

River-specific assessments

ICES (2012) emphasised the problem of basing the risk analysis on management units comprising large numbers of river stocks and recommended that in providing catch advice at the age and stock complex levels for Northern and Southern NEAC, consideration should be given to the recent performance of the river stocks within individual countries. At present, insufficient monitoring occurs to assess performance of all individual stocks in all countries or jurisdictions in the NEAC area (see Section 3.2). In some instances, CLs are in the process of being developed (e.g. Iceland).

The percent of stocks attaining their CLs within each jurisdiction in the NEAC area for which data are available is given in Table 3.3.5.1 (Northern NEAC) and Table 3.3.5.2 (Southern NEAC). The total number of stocks in each jurisdiction which can be assessed against a stock-specific CL are also shown. For Northern NEAC, the percent of assessed stocks within each jurisdiction meeting their CLs ranges between 20% (Teno/Tana River, Finland/Norway) to 88% (Russia) in the two last years (2019 and 2020). For Southern NEAC, this range goes from 0% (France) to 69% (UK, Northern Ireland). Despite the absence of a fishery at Faroes since 1999, and reduced exploitation at West Greenland on the MSW Southern NEAC component, the abundance at the PFA stage in a substantial proportion of stocks in the NEAC area is likely to have been below their stock-specific CLs.

The Working Group, therefore, notes that there are no catch options for the Faroes fishery that would allow all national or stock complex management units to achieve their SERs with a greater than 95% probability in any of the seasons up to 2023/2024. While the abundance of stocks remains low, even in the absence of a fishery at Faroes, particular care should be taken to ensure that fisheries in homewaters are managed to protect stocks that are below their CLs.

3.5.2 Relevant factors to be considered in management

The management of a fishery should ideally be based upon the status of all river stocks exploited in the fishery. Fisheries on mixed-stocks pose particular difficulties for management, when they cannot target only stocks that are at full reproductive capacity. Management objectives would be best achieved if fisheries target stocks that are at full reproductive capacity. Fisheries in estuaries and especially rivers are more likely to meet this requirement. The Working Group also emphasises that the national stock CLs are not appropriate to the management of homewater fisheries. This is because fisheries in homewaters usually target individual or smaller groups of river stocks and can therefore be managed on the basis of their expected impact on the status of the separate stocks.

3.6 Framework of indicators

3.6.1 Background

In the intermediate years of a multiyear catch agreement, an interim assessment is made as a check of the PFA forecasts and to determine whether a full re-assessment of stock status and new catch advice might be required (Figure 3.6.1.1). This assessment relies on a framework of indicators (FWI) which the Working Group has developed to check whether stock status may have changed markedly in any year from that based on the PFA forecast. Full details of the FWI are provided in the Stock Annex. If the FWI suggests that the stock may have performed differently than that projected by the forecast model, a new assessment and new catch advice would be requested. After a period of three years, a full assessment is required regardless in order to inform a potential new multi-annual agreement. Thus, the FWI is not applied and the cycle is started over again.

Indicator time-series are included in the framework based on the following criteria:

- at least ten datapoints;
- a coefficient of determination (r^2) of at least 0.2 for a linear regression between the indicator time-series and the estimated pre-fishery abundance of the relevant stock complex;
- regression significant at the 0.05 probability level; and
- available for inclusion in the FWI in early January.

The FWI was first presented by the Working Group in 2012 (ICES, 2012), and first applied in 2013. Further refinements were made to the FWI in 2013 (ICES, 2013), 2016 (ICES, 2016) and 2018 (ICES, 2018); full details of the changes are provided in the Stock Annex. The latter change resulted in only stock complexes that would be appropriate to changing the multi-year advice being included in the framework in the years between the provision of full catch advice. Thus, in 2017, the FWI was applied using only the indicators for the Southern NEAC 1SW and MSW stock complexes.

As future catch advice could be determined by the status of stocks in any of the four stock complexes, indicators for each of these have been retained in the FWI. However, in any year, the FWI can be applied such that it will only be necessary to apply the indicators from those stock complexes that could result in a change in the multi-year advice following a reassessment. For 2021 (to be applied in January 2022) and 2022 (to be applied in January 2023), this would mean that indicators for Southern NEAC 1SW and MSW salmon, Northern NEAC 1SW and MSW salmon should be considered.

3.6.2 Progress in 2020

During its meeting in 2021, the Working Group updated the FWI. Summary statistics for the candidate indicator datasets are shown for the Northern NEAC and Southern NEAC stock complexes in Tables 3.6.2.1 and 3.6.2.2, respectively. For the Northern NEAC stock complex, six indicator datasets for the 1SW component and five for the MSW component have been retained in the framework for 2021 (to be applied in January 2022) and 2022 (to be applied in January 2023). The 1SW catches in the Tana/Teno river also fulfilled the criteria for inclusion as an indicator for the 1SW component, but since fishing regulations have changed substantially in this river they were not included in the FWI. For the Southern NEAC stock complex, nine indicator datasets for the 1SW component and nine for the MSW component have been retained in the framework for 2021 (to be applied in January 2022) and 2022 (to be applied in January 2023). No indicators were dropped and two were added, since 2018 due to altered r^2 values for the respective indicators.

It is anticipated that most datasets included in the updated FWI will be available in January (when the FWI is required to be run), although this represents a challenging timescale for some indicators. The updated FWI is illustrated in Figure 3.6.2.1.

3.6.3 Next steps

Assuming a new multi-annual agreement is confirmed, the updated FWI will be made available to NASCO to enable them to facilitate intermediate assessments in 2022 and 2023 to determine whether new catch advice might be required. The FWI will then need to be updated, and a new three-year cycle started in 2024.

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

Year	UK (England & Wales)					UK (Scotland)(11)		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
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

Year	UK (England & Wales)					UK (Scotland)(11)		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)
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
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

Year	UK (England & Wales)					UK (Scotland)(11)		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)
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	17
2015	52	33	102	63	30 847	127	65	0	0	0	0	100	6	18 460	2850	12	17
2016	49	34	105	62	30 214	13	43	0	0	0	0	98	4	18 303	3015	19	17
2017	46	32	112	57	35 162	10	41	0	0	0	0	105	5	18 212	4214	20	17
2018	38	30	87	57	31 655	0	26	0	0	0	0	97	8	16 755	3937	19	17
2019 (10)	14	13	60	49	29 126	0	18	0	0	0	0	67	10	17 238	3786	19	17
2020	17	13	64	43	28387	0	18	0	0	0	0	68	10	16 000	3190	19	17
Mean																	
2015–2019	40	28	93	58	31 401	30	39	0	0	0	0	93	7	17 794	3560	18	17
% change (3)	-57.3	-54.2	-31.3	-25.3	-9.6	-100.0	-53.4	0.0	0.0	0.0	0.0	-27.2	51.5	-10.1	-10.4	-	-
Mean																	
2010–2019	45	32	104	62	33 020	122	53	1	0	1	0	124	38	18 363	3123	15	23
% change (3)	-62.3	-59.4	-38.2	-30.6	-14.0	-100.0	-65.8	-100.0	0	-100.0	0.0	-45.1	-73.8	-12.9	2.1	-	-

Notes:

1. Number of gear units expressed as trap months; 2. Number of gear units expressed as crew months; 3. (2020/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; 11. Scotland data for 2020 not available at time of printing. 2019 values used as provisional values for 2020.

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 fishery (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	-	-	-
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	-	-	-

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
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
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

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
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
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
2020	975	419	-	0	10 360	2462	490	541		41	22
Mean											
2015–2019	842	418		0	19 293	4 613	594	437		52	52
% change (3)	15.7	0.1		0.0	-46.3	-46.6	-17.5	23.8		-21.5	-57.4
Mean											
2010–2019	797	443		0	25 699	6 259	682	516		63	57
% change (3)	22.3	-5.5		0.0	-59.7	-60.7	-28.1	4.8		-35.2	-61.7

Notes: 3. (2020/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), 1960–2020 (2020 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	-
2013	310	770	0	-	1080	272	-

Year	Southern countries	Northern countries (1)	Faroes (2)	Other catches in international waters	Total reported catch	Unreported catches	
						NEAC Area (3)	International waters (4)
2014	217	736	0	-	953	256	-
2015	222	859	0	-	1081	298	-
2016	186	842	0	-	1028	298	-
2017	151	863	0	-	1015	318	-
2018	125	804	0	-	929	279	-
2019	83	671	0	-	755	237	-
2020	93	685	0	-	778	239	-
Mean							
2015–2019	154	808	0	-	961	286	-
2010–2019	241	851	0	-	1092	306	-

Notes:

1. All Icelandic catches have 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
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

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)
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	-
2020	3.2	0.8	0.7	0.2	0.27	-
Mean (2)	**3.1**	**1.0**	**1.0**	**0.2**	**0.8**	**0.3**
2015–2019	**3.3**	**0.8**	**1.2**	**0.2**	**0.5**	**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
2020	0.28	0.02	2.54	1.82	2.69	9.58
Mean (2)	**0.22**	**0.06**	**1.22**	**1.12**	**1.40**	**4.89**
2015–2019	**0.26**	**0.08**	**1.27**	**1.60**	**1.89**	**3.58**

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	
2020 (3)						
Mean (2)	8.98	5.73	0.77	0.84	0.11	0.60
2015–2019	9.43	7.22	0.77		0.13	0.49

Notes:

2. Mean of the time-series.

3. No CPUE for net fisheries in 2020 was available because there was no fishing effort for salmon.

Table 3.1.5.4. CPUE for salmon rod fisheries in each Region in UK (England & Wales), 1997–2020. [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	12.0	1.6	6.6	4.2	5.4	7.7	3.4	7.0
2020	13.2	0.0	13.9	6.7	10.6	12.4	7.0	10.5
Mean (2)	**11.8**	**0.2**	**12.5**	**7.3**	**5.7**	**6.1**	**5.1**	**8.3**
2015–2019	**11.6**	**0.3**	**11.7**	**6.9**	**7.7**	**8.3**	**5.0**	**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*		65.4
2017*		52.4
2018*		147.1
2019*		23.2
2020* (2)		23.2
Mean (3)	**50.8**	**148.1**
2015–2019	**74.8**	**67.7**

Notes:

1. Excludes catch and effort for Solway Region.

2. Scotland data for 2020 not available at time of printing, 2019 used as provisional value.

3. Mean of the time-series.

*** No CPUE for fixed engine fisheries due to fishery regulations prohibiting the retention of salmon in coastal waters.**

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
2020	1.18	1.12	0.21	0.37	0.96	0.34
Mean (1)	**1.21**	**1.15**	**0.28**	**0.75**	**1.01**	**0.32**
2015–2019	**1.37**	**1.50**	**0.30**	**0.76**	**1.40**	**0.36**

Notes:

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

Table 3.1.6.1. Percentage of 1SW salmon in catches from countries in the Northeast Atlantic, 1987–2020.

Year	Iceland	Finland	Norway	Russia	Sweden	Northern countries	UK (Scot)(2)	UK (E&W)	France	Spain(1)	Southern countries
1987	64	60	60	65		62	61	68	77		63
1988	78	55	62	55		63	57	69	29		61
1989	69	73	72	70	41	71	63	65	33		63
1990	66	64	66	69	75	65	48	52	45	71	49
1991	72	64	67	62	74	64	53	71	39	37	59
1992	73	72	61	71	69	64	55	77	48	45	60
1993	77	63	62	66	67	62	57	81	74	33	66
1994	66	50	69	69	67	66	54	77	55	61	63
1995	77	60	58	69	85	60	53	72	60	22	61
1996	75	72	51	81	68	61	53	65	51	22	57
1997	75	66	64	84	57	68	54	73	51	21	61
1998	83	71	65	84	66	71	58	82	71	49	66
1999	70	77	62	79	81	66	45	68	27	13	57
2000	85	66	66	77	69	67	54	79	58	63	67
2001	78	51	59	77	54	60	55	75	51	36	64
2002	83	40	51	72	62	56	54	76	69	33	66
2003	78	48	62	73	79	63	52	66	51	14	56
2004	84	46	52	66	50	59	51	81	40	59	62
2005	87	70	63	67	59	68	58	76	41	15	63
2006	87	72	53	76	61	62	57	78	50	16	63
2007	90	34	42	68	34	56	57	78	45	25	63
2008	89	36	47	55	36	57	48	76	42	11	58
2009	91	70	47	57	40	64	49	72	31	30	57
2010	83	53	56	54	49	62	55	78	65	33	65
2011	85	63	41	58	32	55	36	57	31	2	47
2012	86	71	46	75	30	59	49	50	38	18	49
2013	89	59	52	67	38	67	55	58	46	13	55

Year	Ice-land	Fin-land	Nor-way	Russia	Swe-den	North-ern coun-tries	UK (Scot)[2]	UK (E&W)	France	Spain[1]	South-ern coun-tries
2014	77	65	59	66	46	62	49	54	38	4	50
2015	90	55	51	70	32	63	60	47	33	4	54
2016	79	47	42	72	39	53	50	42	51	30	45
2017	86	41	49	43	29	55	46	40	54	29	44
2018	83	74	51	57	45	58	60	45	39	21	51
2019	79	40	49	65	22	54	57	44	29	10	47
2020	88	49	54	75	34	59	57	44	41	25	49
Means											
1987–2000	73	65	63	72	68	65	55	71	51	40	61
2001–2020	85	54	51	66	43	59	53	62	44	21	55

Notes:

1. Asturias Region only for 1987 to 2018; all regions of Spain 2019 to 2020.

2. Scotland data for 2020 not available at time of printing, 2019 value used as provisional value for 2020.

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			14 946	9521	14 946	9521	18 174	16 365
Iceland (north and east)	5019	1851			5019	1851	6195	3182
Norway			54 105	73 770	54 105	73 770	68 831	123 036
Russia	62 285	34 412			62 285	34 412	79 291	61 918
Sweden			1731	2714	1731	2714	2714	4735
Northern NEAC Stock Complex					138 086	122 268	174 727	209 236
France			17 400	5 100	17 400	5 100	22 471	9 451
Iceland (south and west)	16 660	1 632			16 660	1 632	20 566	2 806
Ireland			211 471	46 943	211 471	46 943	269 026	78 294
UK (England & Wales)			53 988	29 918	53 988	29 918	68 682	51 423
UK (N. Ireland)			34 880	6 152	34 880	6 152	42 587	10 316
UK (Scotland)			102 592	84 990	102 592	84 990	130 514	143 293
Southern NEAC Stock Complex					**436 992**	**174 735**	**553 846**	**295 582**

Table 3.3.4.1. Estimated number of returning 1SW salmon by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	24 551	9 413		154 528	17 196		49 714	62 755	1 057 789	82 647	181 778	566 839	2 011 683 (1 782 914; 2 301 600)	
1972	94 633	8 613		117 370	13 709		99 483	50 578	1 124 508	79 679	158 952	586 414	2 115 550 (1 862 392; 2 436 858)	
1973	43 999	10 310		172 924	16 941		61 102	54 214	1 226 184	93 898	138 704	708 704	2 300 731 (2 021 823; 2 641 919)	
1974	60 966	10 302		172 328	24 491		28 356	38 881	1 393 087	116 853	151 686	681 303	2 423 002 (2 123 103; 2 807 032)	
1975	73 234	12 562		263 696	26 483		56 280	60 063	1 540 421	121 016	124 404	570 123	2 489 325 (2 165 311; 2 908 811)	
1976	66 679	12 649		183 684	14 975		52 074	47 413	1 046 787	79 849	86 520	452 583	1 776 214 (1 552 691; 2 062 548)	
1977	37 544	17 528		117 123	6 802		40 195	48 403	905 525	91 532	85 403	548 816	1 734 104 (1 516 136; 1 998 471)	
1978	35 729	17 809		118 381	8 033		40 879	63 442	789 996	105 200	111 323	575 363	1 701 721 (1 500 719; 1 946 663)	
1979	32 152	17 036		164 339	8 254		46 933	58 992	726 354	99 666	78 109	579 188	1 606 510 (1 412 479; 1 839 361)	
1980	25 635	2 578		117 028	10 640		97 686	26 627	553 373	93 346	98 692	381 173	1 265 064 (1 120 297; 1 438 487)	
1981	22 906	13 327		96 789	19 298		77 704	34 397	291 089	98 379	77 320	491 453	1 081 224 (961 523; 1 222 282)	
1982	13 569	6 127		85 137	17 065		48 275	35 311	603 590	83 602	111 796	560 906	1 454 294 (1 302 466; 1 625 826)	
1983	33 307	9 066	701 188	142 092	22 685	910 515 (816 837; 1 019 963)	51 568	44 634	1 063 224	121 599	156 797	624 779	2 076 497 (1 858 280; 2 328 007)	2 990 963 (2 745 678; 3 260 583)
1984	36 424	3 290	729 095	152 582	31 994	955 534 (854 836; 1 074 843)	83 933	27 404	560 348	106 767	61 649	591 495	1 445 113 (1 294 535; 1 618 770)	2 404 985 (2 219 544; 2 612 202)
1985	48 186	22 661	740 934	209 115	38 247	1 063 331 (960 481; 1 182 868)	31 211	44 696	926 762	107 076	79 872	542 664	1 744 686 (1 549 214; 1 973 295)	2 811 679 (2 586 479; 3 064 524)
1986	37 995	28 218	646 342	179 045	39 927	935 798 (848 743; 1 032 943)	48 499	73 188	1 039 807	123 560	89 863	634 111	2 031 792 (1 801 559; 2 298 115)	2 969 643 (2 719 728; 3 250 872)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1987	45 930	16 614	543 652	190 974	31 671	832 928 (757 877; 916 506)	86 658	45 389	670 654	129 161	49 142	544 235	1 554 328 (1 358 981; 1 785 745)	2 388 883 (2 175 292; 2 631 525)
1988	27 042	24 042	498 976	132 000	26 537	710 505 (649 074; 780 204)	29 311	81 880	907 141	176 612	115 858	661 285	1 992 131 (1 754 827; 2 270 148)	2 703 447 (2 458 037; 2 988 715)
1989	58 700	12 953	548 206	197 028	7 709	826 304 (750 802; 917 458)	16 310	45 676	651 599	118 590	111 608	739 780	1 696 901 (1 479 867; 1 971 137)	2 528 570 (2 293 150; 2 812 881)
1990	58 846	9 682	492 083	163 396	17 941	744 145 (678 010; 822 745)	26 792	42 103	408 117	85 065	92 079	479 719	1 148 727 (1 000 279; 1 334 441)	1 894 918 (1 730 158; 2 095 600)
1991	58 075	14 118	429 538	138 727	22 504	665 343 (604 694; 737 702)	19 390	46 349	291 152	84 201	51 549	411 656	916 227 (795 853; 1 068 951)	1 583 677 (1 446 903; 1 752 892)
1992	81 594	26 541	362 469	171 481	25 078	670 967 (613 971; 735 702)	35 473	53 149	422 788	87 958	104 290	536 597	1 256 323 (1 092 013; 1 459 117)	1 928 240 (1 754 450; 2 142 314)
1993	55 075	21 866	363 668	146 918	24 865	615 781 (564 544; 672 318)	50 658	52 033	343 589	122 300	122 112	579 135	1 289 434 (1 109 784; 1 528 048)	1 906 584 (1 719 134; 2 147 759)
1994	30 636	6 982	491 264	173 326	19 206	725 410 (654 874; 810 291)	40 244	42 896	440 873	135 868	83 832	588 882	1 351 459 (1 168 646; 1 580 240)	2 079 789 (1 881 212; 2 317 766)
1995	30 520	18 281	320 651	155 674	28 114	556 663 (510 574; 607 355)	13 533	52 809	490 483	103 797	77 867	571 337	1 320 336 (1 144 867; 1 545 634)	1 878 843 (1 694 990; 2 107 745)
1996	46 952	9 769	244 369	212 210	16 722	533 038 (487 509; 585 772)	16 636	45 590	457 680	76 770	80 384	446 637	1 134 682 (975 370; 1 340 498)	1 669 406 (1 502 700; 1 882 255)
1997	42 594	13 321	282 448	209 096	7 627	557 957 (509 341; 611 029)	8 432	33 392	456 297	69 122	95 356	381 237	1 054 639 (915 511; 1 230 130)	1 613 629 (1 465 649; 1 796 945)
1998	53 660	22 719	368 993	228 596	6 186	684 062 (623 273; 751 577)	16 563	45 578	480 275	75 900	207 345	428 514	1 269 264 (1 109 700; 1 474 480)	1 954 738 (1 780 392; 2 167 969)
1999	78 696	11 584	342 061	176 491	9 638	621 609 (567 903; 680 236)	5 489	37 106	445 174	59 995	54 217	286 284	897 418 (778 223; 1 043 386)	1 520 648 (1 390 655; 1 674 258)
2000	85 420	12 213	563 768	193 205	17 806	877 190 (797 968; 966 198)	14 371	33 011	621 321	91 833	79 518	443 006	1 296 516 (1 120 995; 1 510 821)	2 176 734 (1 977 256; 2 407 096)
2001	62 007	11 039	486 089	259 786	11 060	837 711 (747 526; 946 028)	12 383	29 524	492 902	79 081	63 277	466 587	1 155 634 (1 000 952; 1 361 524)	1 999 605 (1 817 964; 2 223 942)
2002	38 505	19 129	297 326	235 910	10 606	606 286 (537 600; 697 967)	27 875	36 703	431 669	75 296	112 384	346 590	1 045 931 (924 622; 1 195 070)	1 656 599 (1 511 560; 1 827 902)
2003	37 950	10 107	412 517	211 487	5 783	683 375 (607 693; 771 211)	18 351	43 880	421 724	58 131	70 275	346 200	973 397 (845 907; 1 135 483)	1 659 981 (1 507 886; 1 841 758)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2004	16 136	27 396	250 208	148 105	4 816	449 684 (403 686; 506 213)	22 144	44 086	310 754	104 239	67 357	474 525	1 040 289 (885 537; 1 245 371)	1 491 708 (1 329 821; 1 705 433)
2005	35 223	24 335	370 552	168 688	4 754	608 551 (547 829; 680 278)	14 599	64 871	308 913	85 199	84 669	478 020	1 050 877 (900 579; 1 253 375)	1 661 916 (1 497 675; 1 874 515)
2006	57 842	25 746	300 056	204 128	5 287	597 024 (534 580; 675 702)	20 281	45 933	237 483	83 987	57 528	428 434	887 889 (748 370; 1 079 373)	1 490 807 (1 330 094; 1 694 065)
2007	16 899	19 045	168 066	110 215	1 640	317 637 (284 397; 358 970)	16 025	52 587	239 680	80 153	85 079	441 513	948 317 (774 461; 1 182 607)	1 268 596 (1 088 900; 1 505 071)
2008	18 192	17 384	210 270	114 604	2 556	365 541 (328 714; 411 751)	15 785	63 672	252 137	79 390	53 320	355 072	851 829 (693 900; 1 085 873)	1 220 622 (1 053 371; 1 455 477)
2009	32 288	28 013	168 774	109 009	2 719	342 802 (308 585; 382 456)	4 454	71 983	205 112	49 925	33 167	275 731	664 667 (541 831; 838 838)	1 008 454 (880 680; 1 185 045)
2010	25 953	22 534	249 379	123 821	4 617	428 870 (386 830; 477 782)	14 919	73 841	274 409	98 662	32 991	491 811	1 025 204 (829 113; 1 291 925)	1 457 467 (1 251 773; 1 725 181)
2011	29 526	18 515	175 345	131 635	5 089	362 079 (325 518; 405 007)	10 392	52 010	235 495	65 772	23 813	276 539	690 286 (562 902; 887 067)	1 055 201 (920 514; 1 254 129)
2012	51 108	9 626	195 719	152 660	5 611	417 905 (376 044; 471 118)	11 171	29 501	243 217	37 678	55 210	353 054	759 194 (606 627; 980 577)	1 178 876 (1 023 162; 1 405 173)
2013	29 412	22 946	184 435	118 505	3 251	361 864 (323 920; 409 317)	15 754	87 953	204 824	53 662	60 658	278 119	732 415 (604 807; 910 143)	1 095 932 (962 432; 1 279 415)
2014	41 756	10 783	251 473	111 779	9 590	430 205 (381 701; 485 527)	14 059	21 742	126 348	31 505	27 380	161 628	398 348 (328 884; 502 005)	831 867 (743 073; 945 380)
2015	26 063	30 481	221 544	116 233	3 098	401 901 (359 609; 451 714)	12 875	60 452	178 493	38 576	29 362	254 484	597 461 (489 758; 755 996)	1 001 553 (881 685; 1 167 465)
2016	20 354	12 976	171 786	82 690	1 669	292 266 (263 112; 326 920)	11 700	35 514	179 077	41 205	55 375	247 490	595 557 (483 246; 759 082)	889 946 (772 355; 1 053 951)
2017	13 080	12 607	227 070	29 936	4 458	288 695 (258 060; 325 254)	14 884	36 806	195 815	29 600	46 920	216 650	563 367 (456 149; 733 261)	853 781 (739 565; 1 024 554)
2018	32 876	13 458	232 264	99 601	7 248	389 707 (348 672; 438 144)	12 480	31 695	142 275	38 749	41 086	204 292	491 136 (400 052; 618 334)	883 383 (781 625; 1 018 361)
2019	10 793	8 065	180 952	71 576	4 192	278 590 (249 453; 312 402)	12 706	21 139	135 561	25 948	22 808	211 098	446 081 (354 058; 577 216)	725 916 (628 052; 861 203)
2020	9 377	8 600	222 259	51 868	6 226	299 926 (269 457; 335 399)	10 225	27 950	191 340	49 726	36 325	291 708	627 218 (493 885; 817 897)	927 994 (790 966; 1 123 750)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
Mean 10-year	26 434	14 806	206 285	96 648	5 043	352 314 (315 555; 396 080)	12 624	40 476	183 245	41 242	39 894	249 506	590 106 (478 037; 754 158)	944 445 (824 343; 1 113 338)

Table 3.3.4.2. Estimated number of returning MSW salmon by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	22 855	9 653		132 665	639		10 756	24 415	157 543	91 191	21 901	327 487	640 466 (557 045; 742 158)	
1972	23 700	15 059		134 726	508		21 803	37 487	168 334	150 100	19 163	433 142	841 064 (729 428; 971 342)	
1973	38 112	14 092		222 448	2 260		13 185	33 806	182 374	114 277	16 752	429 488	799 853 (695 223; 921 779)	
1974	65 330	13 397		209 696	1 418		6 128	29 194	206 661	85 017	18 307	311 686	663 697 (579 213; 764 790)	
1975	83 524	14 777		225 115	402		12 260	31 019	230 477	113 867	15 009	417 154	830 833 (709 583; 979 033)	
1976	65 219	12 147		194 900	1 208		9 044	26 782	160 113	61 186	10 446	233 797	508 496 (432 561; 603 268)	
1977	45 288	16 957		134 619	520		6 966	26 142	139 750	76 088	10 291	324 988	590 169 (498 587; 713 274)	
1978	23 154	21 809		115 969	639		7 118	33 789	121 130	64 045	13 405	442 786	690 352 (557 983; 873 502)	
1979	23 135	14 431		101 586	1 666		8 125	21 591	108 640	32 052	9 399	353 026	537 097 (431 706; 683 482)	
1980	22 433	20 109		169 334	3 236		16 948	30 423	120 108	103 888	11 892	461 426	751 579 (623 059; 925 664)	
1981	26 656	7 027		96 469	716		11 572	20 280	88 838	145 110	9 345	412 214	695 144 (597 717; 820 514)	
1982	35 489	8 094		85 224	3 485		7 156	14 338	51 414	55 953	13 483	274 619	420 706 (355 737; 507 063)	
1983	39 099	6 165	427 883	124 167	2 286	602 017 (544 478; 667 359)	7 700	23 920	105 993	64 541	18 956	295 844	521 130 (450 981; 611 605)	1 124 269 (1 031 904; 1 235 638)
1984	32 963	7 941	438 599	123 916	3 193	608 267 (551 469; 672 065)	12 735	20 245	76 435	51 057	7 449	261 145	433 090 (366 128; 525 490)	1 044 845 (953 358; 1 154 248)
1985	31 985	5 122	405 022	135 447	1 181	581 088 (527 786; 640 776)	9 425	14 706	83 502	75 691	9 645	271 233	467 910 (394 411; 569 156)	1 051 381 (957 362; 1 166 285)
1986	26 214	13 934	486 425	133 888	606	663 253 (599 492; 736 028)	9 651	12 296	94 892	103 540	10 844	337 660	574 787 (486 786; 686 728)	1 239 654 (1 129 295; 1 368 257)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1987	34 230	14 452	367 415	99 438	2 744	520 683 (472 225; 576 414)	5 147	10 891	117 328	82 789	5 554	237 214	463 153 (388 642; 561 306)	984 606 (893 955; 1 095 062)
1988	24 245	9 319	306 448	99 667	2 933	443 891 (406 427; 488 122)	14 274	12 463	85 018	106 948	15 641	237 117	477 385 (401 109; 575 465)	923 857 (836 156; 1 030 878)
1989	23 694	7 885	219 216	97 124	10 185	359 549 (330 342; 393 767)	6 491	11 089	77 532	86 985	12 423	235 524	434 909 (362 860; 534 998)	796 836 (715 491; 901 247)
1990	26 209	8 315	260 059	124 759	5 343	426 061 (391 136; 468 321)	6 687	11 043	37 277	106 423	11 317	247 547	425 843 (348 119; 530 655)	852 984 (766 575; 965 726)
1991	35 209	5 784	220 496	122 317	7 181	392 423 (361 090; 428 281)	6 075	10 943	55 951	46 924	5 810	194 240	322 844 (260 948; 414 197)	716 671 (645 670; 812 182)
1992	34 042	8 596	238 956	116 304	9 920	409 260 (377 397; 447 164)	7 688	12 329	42 971	35 903	13 325	182 895	297 442 (242 863; 377 902)	708 779 (642 425; 793 708)
1993	35 544	9 720	229 717	137 704	11 207	425 625 (395 734; 458 350)	3 585	6 063	41 944	39 289	31 435	188 962	316 281 (255 173; 404 614)	743 102 (673 868; 836 936)
1994	33 513	8 254	224 482	121 764	8 551	399 050 (367 997; 433 742)	7 624	9 810	67 457	55 657	11 036	228 152	382 950 (313 374; 484 455)	782 934 (706 846; 888 104)
1995	22 140	5 229	240 268	138 523	4 239	412 194 (380 561; 447 692)	3 648	10 097	65 199	55 761	9 354	264 780	413 168 (327 843; 536 471)	826 045 (734 614; 953 656)
1996	20 380	6 862	241 495	104 568	6 996	381 881 (352 191; 415 345)	6 483	6 486	43 704	57 197	10 217	220 346	349 100 (270 781; 465 929)	731 885 (648 228; 851 794)
1997	24 707	3 853	159 117	85 207	5 053	279 599 (257 875; 304 034)	3 335	7 315	56 440	35 903	12 779	163 593	286 057 (224 711; 369 540)	566 663 (500 440; 652 261)
1998	23 522	5 623	191 259	105 471	2 772	330 067 (304 917; 357 642)	2 804	4 523	32 816	23 423	17 473	132 850	216 913 (171 488; 284 247)	547 332 (495 351; 618 559)
1999	28 049	6 463	204 645	93 180	1 978	335 682 (306 771; 367 609)	6 119	8 836	51 592	46 552	7 976	151 753	284 909 (219 832; 374 092)	621 248 (550 008; 714 767)
2000	53 339	3 773	283 173	162 065	7 112	512 229 (472 131; 554 507)	4 243	2 396	64 089	47 779	9 745	154 165	288 560 (231 544; 372 556)	802 122 (730 094; 891 977)
2001	64 556	4 339	333 053	114 522	8 449	527 460 (482 517; 576 785)	4 968	4 218	56 971	51 431	6 617	206 066	337 369 (262 551; 454 405)	866 679 (776 143; 993 141)
2002	56 702	4 119	288 917	125 373	5 757	483 353 (442 735; 527 725)	4 595	4 557	65 660	46 701	8 296	144 299	281 646 (224 346; 360 293)	765 936 (694 201; 856 260)
2003	40 674	4 307	255 713	87 204	1 373	390 946 (358 312; 427 339)	6 640	7 277	69 083	60 618	5 075	171 698	329 241 (261 071; 424 128)	721 798 (642 561; 821 841)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2004	18 541	4 235	232 037	67 216	4 250	327 152 (297 851; 360 108)	12 367	5 867	37 992	51 244	5 351	234 868	355 171 (267 174; 483 660)	683 169 (590 201; 813 820)
2005	15 349	5 248	212 902	80 494	2 855	317 567 (291 584; 346 742)	7 671	5 201	49 434	55 916	6 736	227 343	359 743 (275 963; 482 845)	678 916 (590 542; 801 778)
2006	22 690	5 046	270 776	77 260	2 978	379 580 (348 680; 414 705)	7 690	4 295	35 660	50 187	5 301	279 856	391 244 (289 683; 540 519)	771 522 (665 500; 925 075)
2007	32 756	4 857	230 308	80 498	2 781	352 041 (325 288; 381 807)	7 251	2 652	24 992	48 775	5 488	227 734	323 775 (242 277; 440 686)	676 371 (589 656; 796 757)
2008	33 125	6 229	265 159	125 897	3 918	437 009 (398 311; 481 890)	8 045	3 033	18 761	53 383	4 287	306 405	400 707 (295 564; 560 266)	839 767 (725 380; 1 002 829)
2009	14 133	5 023	207 918	106 963	3 432	339 223 (309 092; 374 555)	3 724	4 694	23 501	41 190	4 335	252 856	336 472 (249 850; 463 564)	677 033 (583 635; 808 460)
2010	22 734	7 140	228 968	132 333	4 018	397 067 (361 533; 436 295)	3 065	9 715	21 982	60 518	6 349	330 664	440 088 (326 757; 603 600)	839 084 (717 045; 1 006 074)
2011	17 511	7 942	318 763	131 960	9 396	487 861 (441 978; 540 611)	8 607	4 933	23 794	101 272	8 096	417 843	578 438 (432 831; 789 775)	1 068 533 (913 115; 1 283 826)
2012	21 140	4 494	279 881	65 028	10 647	382 255 (344 601; 425 252)	6 855	2 810	20 917	79 583	18 991	331 336	471 451 (350 280; 647 151)	855 372 (728 398; 1 034 533)
2013	20 423	5 136	197 306	74 432	4 551	303 001 (275 150; 334 446)	7 046	7 775	23 850	77 742	6 098	303 199	437 122 (326 125; 593 519)	740 983 (625 540; 900 375)
2014	22 067	6 171	202 428	73 553	9 729	315 543 (283 542; 352 641)	8 740	4 771	19 914	52 714	3 312	202 886	300 133 (228 489; 402 259)	617 625 (535 548; 724 909)
2015	21 303	5 887	256 360	69 148	6 651	360 500 (323 930; 404 549)	9 838	4 318	20 715	84 390	4 226	247 626	381 689 (286 697; 515 581)	744 164 (640 961; 883 483)
2016	22 740	8 222	280 996	59 071	2 593	374 474 (336 525; 418 912)	4 199	6 164	20 626	112 406	7 793	269 509	434 517 (321 689; 593 872)	810 648 (689 395; 971 009)
2017	16 481	4 648	284 465	54 530	10 948	372 609 (333 647; 418 335)	4 786	5 258	18 966	89 378	6 339	239 101	374 278 (279 146; 513 089)	748 718 (644 496; 892 575)
2018	10 100	5 124	267 836	71 817	7 280	363 456 (324 645; 407 746)	7 210	5 615	19 299	89 883	5 971	135 618	273 484 (208 443; 364 558)	640 777 (560 371; 740 924)
2019	14 210	3 896	226 085	56 280	14 588	317 257 (285 225; 354 477)	11 503	4 583	15 210	69 992	3 760	169 194	278 392 (207 270; 374 219)	596 699 (517 928; 698 159)
2020	8 534	2 989	228 770	48 365	12 228	302 153 (269 764; 339 746)	5 630	4 415	21 953	125 491	2 254	207 774	372 372 (271 942; 499 916)	675 731 (567 539; 808 408)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
Mean 10-year	17 451	5 451	254 289	70 418	8 861	357 911 (321 901; 399 671)	7 441	5 064	20 524	88 285	6 684	252 409	390 188 (291 291; 529 394)	749 925 (642 329; 893 820)

Table 3.3.4.3. Estimated pre-fishery abundance of maturing 1SW salmon (potential 1SW returns) by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	29 931	11 698			22 176		64 342	77 642	1 347 718	105 942	222 542	723 847	2 556 809 (2 215 373; 2 984 956)	
1972	115 020	10 693		150 843	17 714		128 570	62 774	1 433 839	102 038	195 001	749 042	2 692 510 (2 317 010; 3 162 087)	
1973	53 678	12 813		222 247	21 838		79 171	67 103	1 564 035	120 301	170 066	905 739	2 926 114 (2 514 956; 3 430 804)	
1974	74 352	12 781		221 060	31 577		36 890	48 130	1 777 173	149 480	185 753	868 989	3 083 233 (2 638 707; 3 646 536)	
1975	88 931	15 604		339 093	34 159		73 030	74 338	1 966 250	154 667	152 816	729 709	3 170 257 (2 691 890; 3 758 307)	
1976	81 059	15 694		236 582	19 326		67 533	58 647	1 336 338	102 248	106 249	577 573	2 263 820 (1 932 650; 2 676 781)	
1977	45 815	21 656		150 659	8 782		52 116	59 880	1 152 219	116 599	104 537	697 427	2 203 178 (1 882 807; 2 582 860)	
1978	43 469	22 030		152 258	10 361		52 836	78 611	1 008 375	133 847	136 402	734 033	2 162 322 (1 865 770; 2 519 368)	
1979	39 055	21 082		210 950	10 650		60 815	72 944	926 457	127 433	95 716	737 996	2 040 472 (1 755 445; 2 388 810)	
1980	31 285	3 323		150 688	13 746		126 609	33 248	710 875	120 038	121 784	491 839	1 621 777 (1 407 296; 1 879 538)	
1981	28 039	16 643		125 338	24 982		101 061	42 956	379 959	127 616	96 368	637 339	1 399 647 (1 219 221; 1 616 036)	
1982	16 751	7 797		110 188	22 060		63 029	44 230	776 429	108 808	138 516	725 224	1 869 332 (1 641 456; 2 136 780)	
1983	40 599	11 353	892 441	182 842	29 318	1 159 105 (1 014 965; 1 330 582)	67 329	55 656	1 358 385	156 570	192 876	803 075	2 650 974 (2 318 527; 3 043 876)	3 817 301 (3 411 808; 4 279 460)
1984	44 250	4 119	927 270	195 876	41 239	1 215 273 (1 060 321; 1 398 012)	109 019	33 994	715 073	136 962	75 931	755 696	1 844 087 (1 611 346; 2 115 712)	3 062 410 (2 738 055; 3 425 653)
1985	58 664	28 089	942 411	269 254	49 323	1 352 600 (1 192 347; 1 540 004)	40 579	55 414	1 183 468	137 158	98 355	695 103	2 224 649 (1 937 137; 2 572 965)	3 583 556 (3 197 931; 4 018 259)
1986	46 209	35 000	822 392	230 247	51 518	1 190 859 (1 049 826; 1 353 184)	63 176	90 673	1 328 352	158 514	110 851	814 566	2 592 257 (2 252 374; 2 993 774)	3 787 360 (3 373 327; 4 261 659)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1987	55 856	20 623	691 807	245 674	40 898	1 058 712 (938 415; 1 198 733)	112 353	56 338	855 597	165 244	60 915	698 053	1 986 780 (1 703 573; 2 326 474)	3 052 999 (2 708 409; 3 453 989)
1988	32 971	29 721	634 769	169 326	34 216	903 606 (802 486; 1 021 110)	38 207	101 252	1 155 545	225 444	141 969	845 526	2 532 374 (2 187 832; 2 941 221)	3 440 380 (3 045 913; 3 899 579)
1989	71 453	16 057	698 626	251 638	9 965	1 051 107 (928 403; 1 193 514)	21 257	56 540	829 347	151 937	136 557	943 402	2 157 735 (1 848 045; 2 545 738)	3 212 659 (2 842 660; 3 656 437)
1990	71 463	12 030	627 419	208 584	23 241	946 746 (837 536; 1 072 303)	34 826	52 226	521 116	108 995	112 906	613 253	1 461 277 (1 250 782; 1 729 836)	2 414 017 (2 139 409; 2 733 687)
1991	70 538	17 443	545 940	177 967	29 023	844 193 (747 168; 959 113)	25 090	57 266	369 823	106 893	63 033	525 167	1 164 257 (989 768; 1 378 856)	2 012 269 (1 785 958; 2 274 568)
1992	99 081	32 804	460 751	219 165	32 515	848 263 (756 603; 957 739)	45 837	65 629	537 747	112 169	127 285	682 531	1 594 307 (1 359 020; 1 888 935)	2 445 408 (2 169 433; 2 779 913)
1993	66 920	26 929	462 225	188 314	32 186	780 588 (695 535; 876 336)	65 755	64 190	437 068	155 615	148 973	736 155	1 635 991 (1 382 610; 1 973 167)	2 420 268 (2 125 066; 2 783 889)
1994	37 253	8 625	625 495	222 582	24 833	924 043 (811 797; 1 055 249)	52 127	53 059	560 343	172 766	102 491	749 709	1 715 229 (1 450 920; 2 038 836)	2 642 836 (2 330 504; 3 016 762)
1995	37 159	22 580	407 245	199 532	36 336	706 632 (631 379; 795 355)	17 548	65 295	622 688	132 401	95 077	727 394	1 675 501 (1 425 355; 1 992 873)	2 384 778 (2 097 836; 2 731 836)
1996	57 073	12 063	310 814	272 306	21 660	677 536 (602 794; 764 646)	21 522	56 341	582 181	97 619	98 350	568 157	1 438 131 (1 211 597; 1 737 229)	2 120 484 (1 861 995; 2 447 120)
1997	51 817	16 460	359 314	267 601	9 859	708 748 (628 263; 799 636)	10 892	41 219	580 224	88 073	116 416	484 954	1 332 884 (1 134 722; 1 593 565)	2 046 604 (1 808 844; 2 338 171)
1998	65 193	28 090	468 716	293 944	7 962	868 378 (770 223; 982 700)	21 381	56 261	610 929	96 639	253 198	543 393	1 598 754 (1 369 974; 1 891 888)	2 473 103 (2 189 329; 2 812 493)
1999	95 524	14 306	434 658	225 876	12 477	786 888 (699 699; 886 358)	7 118	45 803	565 892	76 390	66 127	363 839	1 137 299 (968 464; 1 344 751)	1 926 741 (1 711 565; 2 175 118)
2000	103 685	15 068	716 486	247 566	23 059	1 112 276 (986 653; 1 258 805)	18 586	40 752	789 569	116 772	97 059	563 924	1 644 193 (1 391 237; 1 949 857)	2 762 652 (2 443 258; 3 127 731)
2001	75 357	13 607	618 308	332 972	14 271	1 064 312 (926 591; 1 226 537)	16 001	36 446	625 684	100 917	77 307	593 771	1 463 485 (1 246 676; 1 757 590)	2 532 371 (2 245 460; 2 892 327)
2002	46 794	23 633	377 473	302 812	13 704	771 934 (666 966; 906 817)	36 007	45 370	549 142	95 817	136 947	440 124	1 321 102 (1 139 535; 1 546 073)	2 098 635 (1 859 394; 2 383 651)
2003	46 102	12 499	525 103	269 915	7 462	867 956 (754 302; 1 005 895)	23 654	54 291	537 363	74 079	85 918	440 845	1 233 344 (1 050 564; 1 467 609)	2 106 104 (1 863 817; 2 390 961)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2004	19 612	33 830	317 984	189 595	6 218	571 000 (499 835; 658 117)	28 633	54 439	396 060	132 449	82 459	601 582	1 317 884 (1 102 630; 1 601 939)	1 892 648 (1 646 329; 2 205 554)
2005	42 813	30 032	471 723	216 142	6 138	772 726 (677 128; 884 834)	18 856	80 084	393 423	108 484	103 397	607 123	1 329 420 (1 116 814; 1 610 722)	2 108 646 (1 850 975; 2 429 667)
2006	70 218	31 749	381 051	261 599	6 810	756 685 (659 432; 876 172)	26 258	56 805	301 876	106 765	70 358	544 846	1 124 984 (933 369; 1 382 608)	1 887 962 (1 645 579; 2 188 571)
2007	20 528	23 509	213 473	140 819	2 120	403 026 (351 838; 466 432)	20 609	64 912	304 380	101 986	103 740	561 348	1 201 913 (964 936; 1 511 586)	1 606 346 (1 352 578; 1 941 107)
2008	22 192	21 413	267 133	146 763	3 305	464 182 (406 843; 533 616)	20 469	78 747	320 901	101 054	65 339	451 138	1 081 604 (862 866; 1 390 360)	1 548 962 (1 308 900; 1 870 761)
2009	39 310	34 652	214 516	138 074	3 511	431 866 (379 646; 492 590)	5 774	88 700	261 739	63 493	40 536	350 028	840 840 (678 105; 1 075 921)	1 275 467 (1 091 743; 1 526 198)
2010	31 522	27 780	317 132	156 964	5 964	542 641 (476 736; 620 147)	19 325	91 174	349 689	125 738	40 313	626 374	1 301 112 (1 038 713; 1 663 217)	1 846 383 (1 558 652; 2 229 191)
2011	35 891	22 848	223 115	166 622	6 566	457 864 (401 964; 524 167)	13 460	64 266	299 835	83 565	29 196	352 355	875 492 (703 183; 1 138 486)	1 338 423 (1 141 384; 1 614 828)
2012	62 096	11 887	248 715	194 812	7 240	529 113 (462 885; 610 589)	14 422	36 444	309 756	47 861	67 304	448 035	959 923 (760 546; 1 253 608)	1 492 583 (1 269 427; 1 808 097)
2013	35 715	28 337	234 391	152 266	4 203	459 914 (401 220; 530 986)	20 284	108 431	261 211	68 259	74 043	354 402	923 723 (753 037; 1 166 556)	1 387 930 (1 189 545; 1 647 576)
2014	50 725	13 315	319 552	143 435	12 389	545 660 (472 872; 631 208)	18 127	26 814	160 933	40 185	33 456	205 420	506 023 (408 946; 644 413)	1 055 567 (918 677; 1 227 887)
2015	31 678	37 627	281 921	149 469	4 011	510 489 (445 614; 586 614)	16 603	74 576	226 818	49 121	35 928	323 817	757 567 (610 412; 971 286)	1 272 414 (1 092 070; 1 505 339)
2016	24 728	16 037	218 706	106 027	2 151	370 665 (325 167; 425 625)	15 121	43 889	227 763	52 387	68 023	313 948	753 969 (601 599; 968 201)	1 127 043 (957 891; 1 355 330)
2017	15 916	15 598	288 410	38 343	5 762	365 788 (318 646; 421 315)	19 108	45 442	248 545	37 705	57 299	275 058	714 175 (565 970; 937 068)	1 083 458 (918 099; 1 319 872)
2018	39 964	16 596	295 086	128 057	9 405	494 596 (431 287; 570 165)	16 037	39 196	180 246	49 303	50 236	259 476	621 950 (497 348; 791 831)	1 121 456 (966 574; 1 314 335)
2019	13 143	9 964	230 409	91 821	5 441	354 395 (309 762; 406 622)	16 486	26 174	172 970	33 057	27 875	268 949	565 484 (443 498; 744 088)	922 213 (782 635; 1 113 570)
2020	11 389	10 612	282 647	65 763	8 041	380 768 (333 212; 435 908)	13 264	34 492	243 607	63 201	44 868	370 434	796 463 (616 157; 1 051 103)	1 179 197 (983 857; 1 443 812)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
Mean 10-year	32 124	18 282	262 295	123 661	6 521	446 925 (390 263; 514 320)	16 291	49 972	233 168	52 464	48 823	317 189	747 477 (596 070; 966 664)	1 198 029 (1 022 016; 1 435 065)

Table 3.3.4.4. Estimated pre-fishery abundance of non-maturing 1SW salmon (potential MSW returns) by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	47 317	27 022		265 414	4 704		59 281	65 478	381 580	363 532	32 712	1172472	2 089 205 (1 776 962; 2 480 546)	
1972	72 571	25 376		427 818	7 574		39 600	59 257	384 173	282 376	28 741	1077158	1 883 748 (1 590 079; 2 247 874)	
1973	117 047	23 832		395 323	4 882		20 527	50 954	393 763	199 254	31 201	739 585	1 444 737 (1 208 560; 1 735 522)	
1974	149 119	26 452		428 729	3 793		34 795	54 176	448 124	264 750	25 795	985 693	1 829 217 (1 510 427; 2 215 123)	
1975	115 827	21 679		366 109	4 748		30 110	46 830	337 949	180 263	17 883	709 943	1 328 269 (1 123 056; 1 593 368)	
1976	80 916	29 727		253 372	2 678		21 468	45 484	280 139	179 330	17 534	749 008	1 303 279 (1 071 460; 1 597 006)	
1977	42 011	38 016		218 480	2 687		21 847	58 607	248 265	158 551	22 748	947 042	1 467 948 (1 174 689; 1 866 293)	
1978	43 499	25 426		197 866	4 596		20 463	37 803	209 702	86 421	16 166	720 180	1 097 973 (865 145; 1 422 249)	
1979	48 555	36 021		343 278	9 419		40 099	53 759	244 014	231 591	21 006	982 034	1 585 524 (1 283 292; 1 989 719)	
1980	61 915	14 322		235 429	6 854		30 671	37 064	192 822	307 394	17 413	912 831	1 513 387 (1 248 965; 1 833 149)	
1981	76 120	15 969		209 941	11 248		21 242	26 668	124 691	147 564	24 205	658 556	1 009 087 (836 195; 1 228 395)	
1982	79 323	12 172	839 919	266 375	8 038	1 208 952 (1 013 662; 1 444 975)	20 764	42 750	207 880	152 409	32 915	653 174	1 117 846 (928 943; 1 356 825)	2 331 235 (1 978 013; 2 758 444)
1983	64 086	14 677	811 223	249 804	8 050	1 149 995 (960 236; 1 380 119)	26 931	35 883	142 996	109 897	13 265	521 607	857 709 (689 733; 1 070 197)	2 013 417 (1 690 147; 2 392 326)
1984	62 790	9 881	758 239	274 182	4 656	1 112 540 (929 944; 1 336 787)	20 373	26 277	152 155	150 016	17 016	526 415	899 015 (722 888; 1 133 907)	2 016 884 (1 689 810; 2 419 030)
1985	54 724	25 325	918 016	278 159	4 525	1 284 581 (1 066 726; 1 537 767)	24 691	22 390	191 739	220 382	19 237	729 894	1 218 947 (996 569; 1 495 664)	2 507 235 (2 107 450; 2 969 248)
1986	67 949	26 166	710 208	212 980	8 007	1 029 329 (862 989; 1 235 473)	15 730	19 958	225 988	181 112	10 268	548 200	1 009 517 (826 643; 1 240 521)	2 041 610 (1 725 178; 2 425 088)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1987	46 433	16 714	562 374	196 252	6 942	829 930 (695 859; 995 763)	31 527	22 026	166 943	213 946	26 668	517 601	988 233 (804 341; 1 226 473)	1 820 208 (1 529 195; 2 176 648)
1988	46 332	14 383	428 045	195 937	19 912	705 770 (593 480; 844 460)	17 955	19 894	159 208	185 331	21 418	536 852	947 944 (773 741; 1 178 129)	1 658 428 (1 391 852; 1 984 051)
1989	49 257	14 934	480 416	240 855	10 832	798 187 (666 888; 954 127)	14 869	19 555	74 142	199 399	19 387	474 599	810 808 (641 096; 1 041 242)	1 612 283 (1 337 008; 1 951 170)
1990	63 275	10 338	395 976	230 885	13 536	717 590 (596 743; 857 273)	12 713	19 219	100 070	89 814	10 050	360 071	596 616 (464 008; 787 041)	1 320 181 (1 086 834; 1 595 883)
1991	59 830	14 976	412 273	213 644	17 903	720 508 (603 184; 865 654)	16 427	21 446	83 343	74 794	22 409	360 040	583 208 (462 088; 750 742)	1 309 551 (1 089 986; 1 575 663)
1992	62 444	16 958	396 602	252 511	20 267	750 857 (628 607; 897 059)	8 240	10 569	78 308	77 197	52 618	355 204	591 811 (457 040; 772 784)	1 346 840 (1 115 332; 1 629 206)
1993	59 028	14 399	387 486	225 622	15 455	704 370 (585 982; 845 612)	14 429	17 069	113 833	98 249	18 596	388 397	657 069 (507 000; 869 716)	1 365 695 (1 123 135; 1 667 842)
1994	39 570	9 191	417 058	257 666	7 884	733 096 (610 914; 880 187)	7 089	17 535	110 230	99 038	15 832	452 892	709 071 (536 935; 951 389)	1 447 941 (1 182 423; 1 776 250)
1995	36 367	11 961	414 995	193 911	12 650	671 996 (561 076; 808 020)	12 700	11 310	75 942	102 819	17 315	385 104	612 421 (458 509; 837 721)	1 289 080 (1 050 442; 1 591 721)
1996	42 563	6 639	265 845	154 731	8 907	480 919 (399 123; 578 028)	6 558	12 591	96 204	63 891	21 515	281 904	494 033 (372 417; 665 661)	979 476 (794 422; 1 212 523)
1997	40 670	9 702	319 102	192 068	4 917	568 101 (473 435; 684 295)	5 443	7 776	55 705	41 612	29 416	227 539	372 929 (279 631; 505 806)	944 165 (776 876; 1 150 861)
1998	48 124	11 141	340 753	169 407	3 485	574 255 (476 180; 692 421)	11 451	15 172	86 766	80 785	13 371	255 975	482 201 (355 445; 654 194)	1 061 839 (862 784; 1 302 533)
1999	91 475	6 509	471 852	294 837	12 418	879 718 (735 824; 1 058 215)	7 961	4 135	107 114	82 765	16 381	258 151	487 535 (369 977; 653 475)	1 374 341 (1 134 402; 1 663 152)
2000	110 724	7 455	554 317	207 146	14 745	897 548 (746 385; 1 081 067)	9 377	7 253	95 944	89 462	11 076	347 808	572 296 (422 207; 795 083)	1 475 953 (1 207 065; 1 815 143)
2001	97 100	7 071	481 346	225 564	10 132	823 194 (685 454; 991 091)	8 753	7 855	110 976	81 406	13 896	246 440	480 586 (364 154; 638 223)	1 309 751 (1 083 128; 1 586 140)
2002	69 556	7 439	425 616	158 271	2 410	664 748 (551 697; 802 413)	12 440	12 520	116 269	104 694	8 497	288 772	557 385 (418 585; 754 795)	1 225 911 (998 269; 1 512 312)
2003	31 810	7 316	386 999	121 535	7 483	556 551 (459 969; 671 312)	23 139	10 127	64 174	89 178	9 011	393 716	600 438 (434 620; 848 061)	1 160 609 (930 360; 1 467 230)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2004	26 307	9 074	354 733	145 820	5 004	542 374 (450 611; 653 141)	14 352	8 932	82 850	96 818	11 290	382 329	609 315 (445 723; 846 100)	1 156 366 (928 989; 1 448 610)
2005	38 999	8 674	449 903	139 471	5 226	643 363 (536 254; 776 516)	14 410	7 395	59 594	86 919	8 913	468 280	658 883 (467 740; 945 254)	1 308 739 (1 044 880; 1 665 291)
2006	56 402	8 373	382 726	145 555	4 868	598 341 (502 232; 719 133)	13 597	4 567	42 432	84 462	9 220	382 838	548 554 (395 356; 776 284)	1 153 869 (932 717; 1 447 446)
2007	56 843	10 742	442 265	228 627	6 892	747 696 (619 228; 906 381)	15 110	5 228	31 688	92 392	7 190	514 112	678 225 (480 319; 978 532)	1 433 584 (1 143 169; 1 818 097)
2008	24 351	8 673	347 971	194 598	6 059	582 970 (480 597; 703 664)	6 994	8 082	39 737	71 466	7 290	424 979	567 612 (403 844; 819 022)	1 155 901 (921 816; 1 465 846)
2009	39 044	12 330	381 388	239 485	7 063	682 300 (563 296; 823 614)	5 736	16 717	36 994	104 517	10 698	554 227	742 176 (523 065; 1 059 078)	1 431 349 (1 131 328; 1 821 612)
2010	30 096	13 716	531 721	239 945	16 447	835 497 (688 148; 1 010 644)	16 084	8 479	40 406	175 750	13 712	703 407	981 269 (698 846; 1 384 653)	1 822 928 (1 442 991; 2 321 822)
2011	36 343	7 732	465 615	117 537	18 673	648 368 (534 839; 787 670)	12 857	4 853	35 306	137 904	31 926	555 105	797 199 (566 741; 1 133 112)	1 450 815 (1 147 292; 1 849 837)
2012	35 092	8 838	328 292	134 222	7 973	516 569 (427 084; 625 722)	13 238	13 396	40 403	134 813	10 285	507 459	737 100 (529 528; 1 042 874)	1 260 198 (991 999; 1 614 819)
2013	37 896	10 677	337 988	133 538	17 060	540 506 (442 625; 655 349)	16 415	8 240	33 996	91 605	5 594	342 702	510 960 (373 134; 714 765)	1 052 930 (847 916; 1 323 455)
2014	36 659	10 168	427 872	125 685	11 711	614 777 (502 771; 750 812)	18 557	7 451	36 038	147 492	7 180	419 621	654 559 (473 789; 922 575)	1 273 701 (1 015 980; 1 610 589)
2015	39 226	14 234	469 406	107 098	4 561	636 909 (521 914; 771 549)	7 972	10 681	35 446	193 878	13 298	456 380	739 414 (523 810; 1 045 933)	1 381 255 (1 090 213; 1 760 808)
2016	28 303	8 011	473 854	99 187	19 273	630 637 (516 697; 771 059)	9 053	9 069	32 540	155 157	10 727	403 016	637 820 (457 812; 904 803)	1 274 801 (1 017 364; 1 605 705)
2017	17 409	8 805	445 323	130 346	12 747	617 138 (506 762; 755 886)	13 502	9 694	32 846	156 437	10 149	228 518	468 208 (338 600; 651 671)	1 089 862 (879 156; 1 356 314)
2018	24 448	6 704	376 527	101 423	25 451	537 611 (442 165; 657 288)	21 436	7 875	25 881	120 498	6 394	285 664	473 053 (340 842; 661 174)	1 016 217 (817 601; 1 268 609)
2019	14 733	5 165	382 780	87 988	21 468	514 204 (420 717; 627 706)	10 683	7 648	37 663	214 878	3 852	351 709	636 018 (446 530; 888 260)	1 153 181 (908 755; 1 464 141)
2020														

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
Mean 10-year	30 012	8 926	411 962	115 225	15 435	584 080 (479 508; 711 449)	13 746	8 768	34 458	150 296	11 045	394 464	628 259 (450 087; 885 019)	1 216 996 (968 475; 1 539 364)

Table 3.3.4.5. Estimated number of 1SW spawners by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	12 249	4 713			8 145		47 974	31 508	399 355	35 118	36 327	208 343	768 720 (567 363; 1 022 714)	
1972	47 346	4 298		72 248	6 493		96 003	25 270	421 410	38 417	31 839	251 030	881 737 (661 435; 1 162 738)	
1973	22 006	5 145		78 129	7 971		58 972	27 042	456 331	46 120	27 744	306 240	940 782 (699 789; 1 247 182)	
1974	30 608	5 152		93 706	11 522		27 366	19 526	520 384	58 075	30 368	282 924	951 450 (695 314; 1 290 542)	
1975	36 571	6 281		111 563	12 520		54 300	30 033	578 486	60 520	24 938	253 627	1 018 349 (741 329; 1 384 345)	
1976	33 303	6 341		108 961	7 065		50 254	23 711	391 546	39 421	17 348	208 760	741 866 (550 421; 996 332)	
1977	18 799	8 766		74 216	3 208		38 795	24 099	339 259	45 267	17 129	262 010	741 027 (553 466; 973 137)	
1978	17 789	8 887		58 727	3 796		39 444	31 615	294 435	53 367	22 321	273 335	730 588 (553 654; 947 471)	
1979	16 130	8 503		74 967	3 891		45 288	29 594	270 170	51 885	15 619	294 356	725 573 (554 945; 935 792)	
1980	12 778	1 283		73 454	5 013		94 256	13 296	206 257	48 331	19 776	193 608	591 142 (463 332; 745 891)	
1981	11 410	6 670		53 933	9 080		74 984	17 170	70 526	51 423	15 494	255 079	495 330 (390 054; 623 995)	
1982	6 749	3 064		49 919	8 049		46 595	17 623	168 545	43 885	22 419	260 031	570 612 (442 126; 717 244)	
1983	16 549	4 535	161 767	65 021	10 752	260 206 (205 685; 324 243)	49 768	22 278	358 707	63 945	31 344	292 020	833 981 (650 262; 1 041 992)	1 094 893 (902 571; 1 313 168)
1984	18 079	1 647	163 836	80 780	15 016	281 561 (222 323; 349 791)	80 973	13 640	197 385	56 050	12 360	272 291	646 903 (516 286; 801 378)	929 400 (782 217; 1 096 076)
1985	23 896	11 326	171 170	92 537	18 051	320 470 (259 478; 389 707)	30 111	22 413	232 993	56 121	15 968	290 953	661 787 (499 372; 851 036)	985 206 (808 678; 1 186 324)
1986	18 908	14 093	152 369	102 193	18 864	308 589 (254 556; 368 464)	45 099	36 536	324 273	65 359	18 053	327 590	840 751 (650 217; 1 067 576)	1 151 473 (948 953; 1 384 556)
1987	22 880	8 305	127 303	95 863	14 914	271 404 (225 815; 322 657)	80 645	22 639	201 418	69 766	15 318	301 480	720 800 (553 867; 924 309)	992 614 (818 293; 1 205 926)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1988	13 516	12 025	117 558	86 748	12 505	244 230 (204 910; 290 221)	27 248	41 036	342 628	95 843	41 237	413 397	984 153 (784 663; 1 214 316)	1 228 806 (1 027 390; 1 461 684)
1989	23 360	6 482	183 895	96 466	3 634	315 601 (266 731; 376 643)	15 186	22 862	222 391	64 670	12 252	468 308	819 528 (631 654; 1 055 683)	1 139 077 (939 606; 1 384 489)
1990	23 408	4 832	165 606	97 164	9 848	302 920 (258 689; 356 114)	24 906	21 114	160 479	46 364	34 926	326 905	628 649 (500 203; 792 134)	933 806 (796 474; 1 104 916)
1991	23 145	7 077	143 646	83 263	12 359	271 930 (231 162; 320 069)	18 028	23 176	117 274	47 105	18 346	282 556	518 002 (411 897; 656 561)	790 375 (676 782; 938 212)
1992	32 714	13 295	122 209	116 126	13 802	301 239 (261 946; 345 281)	32 983	26 588	159 612	49 700	45 888	370 680	701 490 (559 470; 884 129)	1 003 444 (855 009; 1 190 634)
1993	21 897	10 950	121 042	114 001	13 642	283 769 (246 481; 324 636)	47 077	26 074	141 799	72 334	72 034	399 909	779 588 (618 994; 995 771)	1 063 556 (898 939; 1 284 407)
1994	12 193	3 497	166 573	116 193	10 494	310 692 (261 533; 370 976)	37 434	21 467	125 663	80 881	25 254	404 403	714 516 (552 364; 914 647)	1 028 601 (856 247; 1 239 152)
1995	12 179	9 141	107 451	121 149	17 581	270 108 (235 377; 307 996)	11 864	26 350	177 101	64 789	25 773	395 756	713 114 (560 109; 911 873)	984 171 (824 111; 1 187 034)
1996	21 049	4 888	80 613	138 192	10 448	257 233 (226 340; 291 134)	14 573	22 753	183 800	49 007	34 728	329 863	646 125 (504 998; 829 111)	903 591 (759 496; 1 090 382)
1997	19 014	6 644	105 321	158 775	4 776	296 308 (259 646; 335 872)	7 372	16 724	226 144	46 004	38 220	286 647	632 325 (510 794; 790 338)	929 286 (802 036; 1 092 493)
1998	24 153	11 347	138 673	163 526	3 861	344 049 (298 899; 392 592)	14 498	22 757	222 104	52 104	155 504	322 742	804 654 (661 390; 988 159)	1 150 842 (999 269; 1 338 277)
1999	31 357	6 036	127 945	162 701	5 999	336 691 (293 078; 383 854)	4 799	18 943	232 007	42 301	20 078	220 057	547 537 (443 098; 675 517)	885 497 (772 320; 1 018 862)
2000	33 825	6 389	213 564	141 453	11 132	409 569 (350 831; 476 873)	12 579	16 865	353 076	64 662	33 926	331 763	825 947 (670 906; 1 017 051)	1 237 657 (1 069 015; 1 439 434)
2001	24 593	5 858	186 084	198 601	6 921	425 748 (362 271; 495 752)	10 839	15 363	256 107	56 924	32 266	360 428	744 543 (599 885; 935 486)	1 172 585 (1 012 725; 1 367 838)
2002	17 278	10 352	111 972	210 547	6 607	358 748 (302 129; 424 309)	24 391	19 034	217 133	54 375	61 703	264 782	656 354 (542 906; 795 930)	1 017 064 (885 672; 1 169 196)
2003	16 948	5 442	157 142	198 928	3 598	385 610 (322 453; 455 652)	16 043	22 743	247 363	45 672	32 949	279 510	659 400 (539 761; 809 351)	1 046 019 (910 733; 1 211 726)
2004	7 236	15 066	93 954	146 295	3 000	267 382 (225 416; 314 526)	19 350	22 937	156 958	80 959	39 606	386 053	723 856 (579 411; 913 547)	991 919 (841 690; 1 185 029)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2005	15 759	13 607	140 401	133 045	2 975	308 585 (262 131; 360 236)	12 796	33 650	171 178	66 472	50 777	388 995	738 365 (599 167; 925 253)	1 048 166 (900 469; 1 239 526)
2006	25 866	14 192	111 171	162 731	3 291	319 442 (270 845; 374 225)	17 722	23 884	127 338	67 622	38 996	346 829	636 899 (507 438; 811 883)	958 948 (817 938; 1 142 572)
2007	7 571	10 666	62 278	123 645	1 023	206 630 (172 827; 246 532)	14 035	27 876	220 914	65 730	67 897	362 688	791 954 (627 133; 1 016 515)	999 729 (830 974; 1 226 684)
2008	8 168	10 071	87 921	93 261	1 851	202 681 (173 135; 235 894)	13 819	33 756	229 754	65 467	42 832	294 159	711 335 (561 240; 939 510)	915 185 (760 466; 1 146 216)
2009	14 553	16 780	71 900	101 292	1 976	208 037 (177 252; 244 140)	3 894	37 406	188 819	41 307	26 376	228 581	549 353 (433 173; 719 463)	758 637 (636 925; 931 039)
2010	11 601	13 555	115 868	92 426	3 340	238 705 (204 720; 278 360)	12 995	39 126	252 031	81 522	27 756	400 575	851 841 (664 690; 1 108 146)	1 092 493 (899 365; 1 350 630)
2011	13 298	11 475	79 904	102 572	3 325	212 295 (183 183; 245 140)	9 088	27 630	216 150	52 017	20 649	226 838	577 306 (455 644; 770 872)	790 768 (664 699; 986 436)
2012	22 966	5 776	90 271	109 444	4 078	234 393 (202 727; 270 834)	9 766	15 640	221 250	31 276	50 353	297 826	653 645 (510 128; 867 853)	888 364 (743 864; 1 107 608)
2013	13 198	14 219	91 044	100 337	2 276	222 979 (190 550; 260 071)	13 744	46 654	187 868	44 457	55 568	225 832	604 264 (482 361; 777 027)	828 126 (701 793; 1 005 469)
2014	18 667	6 665	137 481	90 644	6 704	263 589 (221 979; 312 000)	12 275	11 786	116 544	26 502	25 333	130 143	337 736 (271 348; 439 141)	604 596 (523 676; 711 801)
2015	11 706	19 838	108 894	89 717	2 168	234 664 (200 249; 273 026)	11 236	33 267	163 728	32 683	27 336	212 148	503 132 (400 271; 656 628)	739 278 (628 321; 896 978)
2016	9 136	8 558	82 651	76 628	1 252	179 657 (153 576; 209 683)	10 220	19 582	165 067	35 117	52 145	215 280	521 939 (415 770; 680 505)	702 856 (591 856; 862 308)
2017	7 850	8 434	110 003	39 564	3 340	171 216 (142 776; 204 368)	13 034	20 216	180 905	26 136	43 379	190 436	495 902 (393 911; 662 802)	668 663 (561 509; 836 379)
2018	19 699	9 015	121 114	51 400	5 789	210 157 (178 630; 246 387)	10 942	17 400	131 758	35 127	38 167	178 645	432 038 (345 336; 555 463)	643 719 (550 816; 772 264)
2019	6 458	5 787	87 539	69 452	3 356	174 408 (148 103; 204 503)	11 099	11 859	125 455	25 368	21 376	187 871	399 386 (312 127; 525 399)	574 849 (482 861; 703 557)
2020	5 638	6 359	110 007	45 520	5 132	174 312 (146 794; 206 028)	8 947	16 234	175 568	49 324	35 592	261 518	566 049 (440 631; 749 871)	741 496 (613 010; 928 593)
Mean 10-year	12 861	9 613	101 891	77 528	3 742	207 767 (176 857; 243 204)	11 035	22 027	168 429	35 801	36 990	212 654	509 140 (402 753; 668 556)	718 271 (606 240; 881 139)

Table 3.3.4.6. Estimated number of MSW spawners by year for NEAC countries (50% quantile of the Monte Carlo distribution only) and region (50% (5%; 95%) quantiles of the Monte Carlo distribution).

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1971	10 227	2 895			270		6 696	7 329	81 990	52 370	10 957	99 890	267 079 (190 523; 359 531)	
1972	10 519	4 504		58 806	214		13 683	11 228	88 183	93 148	9 590	134 998	361 795 (259 138; 481 140)	
1973	16 927	4 222		65 955	955		8 215	10 158	95 032	71 590	8 395	112 417	316 017 (218 954; 430 177)	
1974	29 210	4 037		98 437	597		3 818	8 752	108 531	53 332	9 153	69 316	260 339 (181 478; 354 161)	
1975	37 413	4 436		86 579	169		7 640	9 323	121 031	71 654	7 511	140 849	368 533 (257 382; 504 643)	
1976	28 776	3 621		86 448	509		5 664	8 032	83 951	38 419	5 230	89 951	238 109 (167 997; 325 605)	
1977	20 293	5 080		71 647	218		4 366	7 859	73 587	47 590	5 145	130 079	274 750 (191 044; 386 487)	
1978	10 278	6 489		50 731	269		4 453	10 132	63 769	40 718	6 714	218 227	351 964 (230 338; 518 103)	
1979	12 546	4 335		44 453	705		5 070	6 441	56 879	20 876	4 704	177 188	275 239 (179 030; 409 266)	
1980	12 218	6 050		47 792	1 363		10 578	9 143	62 954	67 215	5 950	220 419	383 923 (265 593; 543 556)	
1981	14 640	2 100		66 211	303		7 492	6 065	46 567	94 135	4 678	155 637	322 656 (231 864; 438 926)	
1982	19 368	2 439		40 598	1 465		4 636	4 308	32 468	36 326	6 730	100 645	188 901 (129 381; 267 651)	
1983	21 298	1 854	100 893	49 015	964	176 610 (141 551; 217 153)	5 000	7 154	63 347	42 130	9 474	96 292	227 873 (163 816; 310 352)	405 529 (330 853; 496 264)
1984	18 002	2 382	103 987	62 073	1 352	189 589 (154 262; 229 351)	8 295	6 045	43 060	33 225	3 720	111 723	209 836 (148 275; 293 481)	401 107 (329 654; 491 643)
1985	17 631	1 540	95 804	51 349	495	168 299 (136 506; 203 648)	6 095	4 406	53 289	49 234	4 818	108 701	230 128 (162 599; 322 886)	399 694 (324 708; 498 039)
1986	14 317	4 169	114 760	52 444	257	187 868 (149 755; 231 360)	6 251	3 703	51 009	68 059	5 427	130 018	270 887 (189 951; 372 080)	459 677 (370 410; 569 067)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
1987	18 753	4 343	89 551	53 303	1 157	169 644 (137 168; 206 621)	3 341	3 263	79 472	54 720	3 003	97 719	245 926 (178 489; 336 197)	417 003 (340 410; 511 931)
1988	13 245	2 808	72 836	44 837	1 241	136 807 (111 129; 165 334)	9 310	3 768	53 148	70 639	10 016	85 452	238 601 (168 781; 329 160)	376 024 (301 187; 469 753)
1989	10 559	2 357	77 576	50 858	4 325	146 953 (125 506; 171 265)	4 209	3 331	40 795	57 986	4 967	94 249	209 954 (144 207; 302 093)	358 374 (286 706; 453 038)
1990	11 658	2 491	91 010	48 103	2 673	157 564 (133 267; 187 004)	4 355	3 342	14 956	71 038	7 025	110 570	216 403 (145 245; 312 317)	375 182 (298 672; 476 058)
1991	15 680	1 737	76 825	60 505	3 595	159 731 (136 464; 185 671)	3 950	3 268	41 104	31 712	3 311	103 678	189 852 (133 121; 273 487)	350 709 (289 091; 435 622)
1992	15 157	2 572	84 223	58 493	4 932	166 972 (142 616; 194 626)	5 017	3 681	20 889	24 423	8 920	78 315	143 648 (93 780; 216 365)	311 279 (255 189; 387 821)
1993	15 891	2 907	78 392	55 928	5 565	160 080 (137 205; 185 610)	2 331	1 826	24 175	27 615	27 660	91 844	180 937 (124 187; 261 232)	342 361 (279 663; 425 060)
1994	14 994	2 480	76 940	65 311	4 275	165 306 (141 989; 190 941)	5 334	2 937	40 153	39 312	6 625	111 522	209 069 (146 044; 301 558)	375 088 (307 064; 470 552)
1995	9 826	1 572	83 189	64 385	2 425	163 151 (138 314; 190 725)	2 553	3 032	37 939	40 664	5 432	148 437	242 130 (163 464; 353 954)	405 901 (323 699; 521 044)
1996	10 132	2 065	82 987	63 252	4 036	163 728 (139 626; 190 149)	4 540	1 937	19 627	42 315	6 783	135 672	215 851 (143 790; 322 194)	380 020 (304 654; 488 981)
1997	12 260	1 152	57 609	52 808	2 896	128 114 (109 117; 148 763)	2 334	2 200	39 068	27 392	8 472	102 473	188 824 (131 146; 266 051)	317 206 (256 429; 396 748)
1998	11 727	1 687	69 582	42 052	1 592	127 800 (107 750; 149 662)	1 958	1 360	12 505	18 215	13 579	78 664	128 981 (87 462; 190 469)	257 210 (210 633; 321 729)
1999	13 957	2 267	72 193	54 789	1 136	144 990 (122 612; 170 283)	4 288	2 839	34 158	38 235	5 414	99 091	196 223 (134 527; 279 537)	342 167 (275 598; 427 151)
2000	26 580	1 352	103 015	58 917	4 088	195 101 (166 133; 227 948)	2 966	813	44 246	40 547	6 317	94 761	195 833 (142 992; 272 831)	392 533 (329 917; 473 022)
2001	29 051	1 644	122 606	89 026	4 839	249 128 (212 180; 289 372)	3 479	1 399	37 039	44 073	4 283	143 731	241 185 (171 450; 348 127)	491 874 (411 071; 603 956)
2002	25 201	1 653	107 358	74 433	3 301	213 661 (181 594; 249 343)	3 216	1 592	47 623	40 147	4 480	97 358	201 821 (147 958; 274 975)	416 315 (353 028; 497 455)
2003	18 173	2 020	95 609	63 416	785	181 954 (154 840; 211 813)	4 646	2 327	54 205	54 143	2 266	124 112	250 426 (186 635; 338 606)	433 815 (361 455; 525 135)
2004	8 270	1 903	87 884	48 068	2 446	150 037 (125 598; 177 540)	8 635	1 928	24 683	45 804	3 263	171 898	263 650 (182 337; 380 716)	414 292 (329 246; 533 745)

Year	Northern NEAC						Southern NEAC							NEAC Area
	Finland	Iceland (N&E)	Norway	Russia	Sweden	Northern NEAC (5%; 95%)	France	Iceland (S&W)	Ireland	UK(EW)	UK(NI)	UK(Scot)	Southern NEAC (5%; 95%)	NEAC (5%; 95%)
2005	6 848	2 409	78 876	36 334	1 639	126 999 (106 694; 149 721)	5 374	1 823	37 853	50 012	4 185	173 422	280 272 (202 544; 392 981)	408 059 (327 692; 521 427)
2006	10 197	2 776	101 360	46 538	1 716	163 509 (137 738; 192 310)	5 379	1 492	25 080	45 577	3 907	222 975	312 741 (218 603; 449 678)	476 758 (378 720; 616 351)
2007	14 696	3 118	84 080	39 883	1 592	144 163 (122 235; 168 258)	5 074	905	21 580	44 724	4 393	178 828	262 301 (187 123; 369 856)	406 864 (328 167; 516 354)
2008	14 903	3 422	125 726	47 376	2 646	194 888 (165 178; 231 672)	5 620	1 305	15 985	48 974	3 572	248 152	330 470 (233 963; 475 745)	527 185 (423 576; 675 652)
2009	6 329	3 216	100 288	70 096	2 309	184 317 (155 953; 217 113)	2 605	1 736	20 069	37 868	3 579	206 504	278 256 (198 945; 394 889)	463 569 (378 061; 584 233)
2010	10 188	4 428	122 966	60 862	2 711	202 277 (172 636; 236 017)	2 142	3 402	18 931	55 682	5 768	266 181	360 098 (255 615; 508 926)	563 827 (453 671; 715 900)
2011	7 854	5 239	178 658	72 444	5 636	271 584 (230 303; 319 398)	5 999	1 873	20 152	90 936	7 041	340 759	480 734 (345 565; 674 331)	754 245 (610 874; 949 495)
2012	9 481	3 016	157 135	64 061	7 177	242 285 (205 902; 284 152)	4 796	1 323	17 834	73 170	17 371	275 515	401 449 (289 146; 562 420)	645 194 (526 206; 810 481)
2013	9 173	3 541	111 633	33 573	2 956	161 894 (136 753; 190 539)	4 922	3 496	20 475	71 083	5 597	251 168	368 020 (266 105; 511 667)	530 577 (424 839; 676 880)
2014	9 895	4 321	124 260	36 798	6 306	182 797 (153 090; 217 317)	6 129	2 394	16 950	48 499	3 085	165 777	250 800 (184 058; 344 956)	434 946 (359 649; 533 047)
2015	9 532	4 005	147 836	33 855	4 653	200 964 (167 793; 241 851)	6 878	2 029	17 668	77 793	3 974	208 715	327 635 (239 509; 451 755)	530 573 (435 358; 658 702)
2016	10 200	5 826	160 137	31 820	1 937	210 677 (176 731; 251 141)	2 940	3 266	17 912	104 008	7 434	232 046	381 166 (276 029; 529 196)	593 609 (479 105; 742 699)
2017	9 047	3 624	162 480	25 136	8 178	209 731 (174 033; 251 646)	3 343	2 837	16 470	84 201	5 987	207 312	330 579 (241 847; 458 957)	541 829 (445 677; 675 190)
2018	5 536	4 053	159 965	25 201	5 461	201 078 (166 202; 241 992)	5 038	2 747	16 563	85 446	5 645	116 027	241 050 (179 743; 328 364)	445 167 (370 649; 540 005)
2019	7 768	3 039	130 429	31 655	11 632	187 021 (156 792; 222 409)	8 045	2 390	13 039	69 251	3 579	149 434	249 897 (183 321; 337 878)	437 897 (363 794; 529 583)
2020	4 685	2 661	133 229	23 926	10 084	176 037 (146 362; 211 090)	3 943	2 828	18 653	124 985	2 161	184 825	342 420 (246 933; 459 621)	519 483 (417 804; 642 800)
Mean 10-year	8 317	3 932	146 576	37 847	6 402	204 407 (171 396; 243 153)	5 203	2 518	17 572	82 937	6 188	213 158	337 375 (245 226; 465 915)	543 352 (443 396; 675 888)

Table 3.3.5.1. Time-series of jurisdictions in the 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	21	8	38%
2017	25	15	4	29%	439	191	161	83%	85	8	7	88%	24	22	6	27%
2018	25	15	6	40%	439	193	161	83%	85	8	7	88%	24	23	7	30%
2019	25	15	5	33%	439	177	133	75%	85	8	7	88%	24	24	6	25%
2020	25	15	3	20%	439	NA	NA	NA	85	2	1	50%	24	24	6	25%

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

Table 3.3.5.2. Time-series of jurisdictions in the 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	42	67%								
1995									63	63	26	41%								
1996									63	63	33	52%								
1997									64	64	21	33%								
1998									64	64	31	48%								
1999									64	64	21	33%								
2000									64	64	26	41%								
2001									64	58	20	34%								
2002									64	64	27	42%	10	10	4	40%				
2003									64	64	20	31%	10	10	4	40%				
2004									64	64	41	64%	10	10	3	30%				
2005									64	64	31	48%	10	10	4	40%				
2006									64	64	37	58%	10	10	3	30%				
2007					141	141	45	32%	64	64	32	50%	10	6	2	33%				
2008					141	141	54	38%	64	64	42	66%	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	27	27	2	7%	141	141	58	41%	64	64	39	61%	11	9	3	33%	173	173	112	65%
2012	29	29	1	3%	141	141	58	41%	64	64	34	53%	19	15	7	47%	173	173	110	64%
2013	30	29	4	14%	143	143	57	40%	64	64	20	31%	19	16	8	50%	173	173	97	56%
2014	33	29	2	7%	143	143	57	40%	64	64	14	22%	19	17	4	24%	173	173	83	48%
2015	35	35	3	9%	143	143	55	38%	64	64	23	36%	19	17	7	41%	173	173	92	53%
2016	35	34	2	6%	143	143	48	34%	64	64	21	33%	19	17	13	76%	173	173	90	52%
2017	36	36	1	3%	143	143	44	31%	64	64	29	45%	19	16	8	50%	173	173	84	49%
2018	37	37	3	8%	143	143	41	29%	64	64	13	20%	19	16	7	44%	173	173	51	29%
2019	37	34	0	0%	143	143	40	28%	64	62	10	16%	19	18	6	33%	173	173	76	44%
2020	37	35	1	3%	144	144	39	27%	64	63	21	33%	19	13	9	69%	173	NA	NA	NA

NA = data pending.

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

Smolt migration year	Iceland (1)			Norway (2)		France (3)			
	Ellidaar	R.Vesturdalsa (4)		R. Imsa		Scorff		Bresle	
	1SW	1SW	2SW	1SW	2SW	1SW	2SW	1SW	2SW
1975	20.80								
1980									
1981				17.30	4.00				
1982				5.30	1.20				1.17
1983				13.50	1.30			1.69	0.83
1984				12.10	1.80			3.75	1.31
1985	9.40			10.20	2.10			3.78	0.88
1986				3.80	4.20			6.60	1.45
1987				17.30	5.60			5.93	2.41
1988	12.70			13.30	1.10				
1989	8.10			8.70	2.20				
1990	5.40			3.00	1.30				
1991	8.80			8.70	1.20				
1992	9.60			6.70	0.90			2.73	0.95
1993	9.80			15.60				2.52	0.40
1994	9.00							4.64	1.1
1995	9.40		1.45	1.80	1.50	9.10	0.48	2.01	0.75
1996	4.60	2.51	0.37	3.50	0.90	20.22	1.10	1.50	0.68
1997	5.30	1.00	1.51	1.70	0.30	4.91	0.69	3.58	0.87
1998	5.30	1.53	1.04	7.20	1.00	4.80	0.10	1.67	0.72
1999	7.70	1.30	1.22	4.20	2.20	10.26	1.19	7.43	2.09
2000	6.30	1.14	0.68	12.50	1.70	8.63	0.69	5.48	1.91
2001	5.10	3.40	1.32	3.60	2.23	4.67	0.32		
2002	4.40	1.11	2.31	5.50	0.90	18.17	4.18	1.50	0.78
2003	9.10	5.47	0.59	3.50	0.70	10.12	0.95	2.77	1.65

Smolt migration year	Iceland (1)			Norway (2)		France (3)			
	Ellidaar	R.Vesturdalsa (4)		R. Imsa		Scorff		Bresle	
	1SW	1SW	2SW	1SW	2SW	1SW	2SW	1SW	2SW
2004	7.70	5.68	0.60	5.90	1.40	5.36	0.92	3.42	1.56
2005	6.40	2.47	0.91	3.70	1.80	7.60	0.73	2.03	0.40
2006	7.10	1.75	0.95	0.80	5.80	6.05	1.01	2.70	0.44
2007	19.25	0.89	0.30	0.80	0.60	3.66	1.35	2.37	0.86
2008	14.90	2.59	1.07	1.10	2.30	2.49	0.59	1.28	0.68
2009	14.20	1.33	1.57	2.40	3.10	5.12	1.41	11.89	2.97
2010	8.60	1.97	1.11	1.70	1.10	3.36	1.07	4.57	1.19
2011	6.10	1.31	0.57	3.90	2.90	3.98	1.11	2.01	1.15
2012	10.90	2.06		3.50	1.70	7.09	1.51	2.08	0.83
2013	4.30		0.33	2.20	2.40	7.62	1.66	4.00	2.50
2014	7.20	1.62		3.00	0.80	5.11	0.66	5.85	1.07
2015	10.90			1.40	1.40	7.47	1.88	3.08	0.84
2016	7.90		2.00	4.10	1.30	7.93	1.29	4.04	0.96
2017	10.80	2.30		3.50	1.60	4.59	0.53	8.94	2.07
2018	7.80		0.35	3.10	0.80	4.37	0.78	3.15	1.00
2019	14.10	0.90		2.10		8.51		3.77	
Mean (5)	9.09	2.12	1.01	5.85	1.87	7.25	1.09	3.83	1.20
Five-year	10.30	1.60	1.18	2.84	1.28	6.57	1.12	4.60	1.22
Ten-year	8.86	1.69	0.87	2.85	1.56	6.00	1.17	4.15	1.29

Notes: See notes under Table 3.3.6.1 Cont'd below.

Table 3.3.6.1 Cont'd. Estimated return rates of wild smolts (%) 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) (6)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (7)	2SW (8)	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						
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				

Smolt migration year	Ireland			UK(Scotland) (2)		UK(N. Ireland) (6)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (7)	2SW (8)	1SW	MSW	1SW	MSW	1SW	MSW
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
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

Smolt migration year	Ireland			UK(Scotland) (2)		UK(N. Ireland) (6)		UK(England & Wales)					
	R. Corrib		B'shoole	North Esk		R. Bush		R. Dee		R. Tamar		R. Frome	
	1SW	2SW	1SW	1SW	MSW	1SW (7)	2SW (8)	1SW	MSW	1SW	MSW	1SW	MSW
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	1.80	4.20	2.30	5.90	3.00
2016	6.90	0.20	7.50			3.80	0.66	0.40	3.90	3.50	1.60	4.40	2.00
2017	3.60	0.40	7.10			3.20	0.68			5.00	5.20	2.60	1.90
2018	2.25	0.40	8.03			2.80	0.09	1.00	6.60	3.70		1.60	1.90
2019	2.55		8.21			7.10		2.10		6.30		4.70	
Mean (5)	7.98	1.01	13.59	7.50	4.00	14.43	1.01	3.02	2.05	4.29	2.51	4.31	2.08
five-year	4.16	0.40	7.73			4.72	0.49	1.00	4.10	4.54	3.45	3.84	2.20
ten-year	3.26	0.40	7.86			4.94	0.75	1.58	2.21	3.71	2.94	3.60	2.23

Notes:

1. Microtags.

2. Carlin tags, not corrected for tagging mortality.

3. France data based on returns to freshwater.

4. Assumes 50% exploitation in rod fishery.

5. Time-series mean.

6. Assumes 30% exploitation in trap fishery.

7. Microtags, corrected for tagging mortality.

8. Bush 2SW data based on returns to freshwater.

Table 3.3.6.2. Estimated return rates of hatchery smolts (%) 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] R. Ranga		Norway[2] R. Imsa (3)		R. Drammen		Sweden[2] 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	0.40				
2019	0.60		3.00					
Mean (4)	0.72	0.08	3.74	0.79	1.34	0.82	4.86	1.20
five-year	0.44		2.44	0.43				
ten-year	0.59		2.30	0.62				

Notes: See notes under Table 3.3.6.2 Cont'd below.

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

Smolt migration year	Ireland										UK(N. Ireland)[1]	
	R. Shannon	R. Screebe	R. Burrishoole[5]	R. Delphi/ R. Burrishoole	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[6]	R. Corrib Galway[6]	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)[1]	
	R. Shannon	R. Screebe	R. Burrishoole[5]	R. Delphi/ R. Burrishoole	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[6]	R. Corrib Galway[6]	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)[1]	
	R. Shannon	R. Screebe	R. Burrishoole[5]	R. Delphi/ R. Burrishoole	R. Delphi	R. Bunowen	R. Lee	R. Corrib Cong.[6]	R. Corrib Galway[6]	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	0.73	1.34	1.21
2014	0.10	0.70	4.40		2.30		0.10	1.60	1.20	0.12	0.75	0.67
2015	0.40		3.50		0.30		0.10	2.20	1.10	0.11	2.89	1.44
2016	0.60		3.50		2.40		0.03	2.20		0.08	0.52	2.61
2017	0.40		3.50		0.80		0.02	1.30	0.70	1.52	0.51	0.89
2018	0.21		4.50		0.40		0.02	1.80		1.34	0.31	0.42
2019	0.33		4.71		0.76		0.01	1.98		1.38	0.92	1.04
Mean (4)	2.67	2.93	8.52	10.79	3.23	3.75	3.39	2.61	3.93	2.84	3.24	5.27
five-year	0.39		3.94		0.93		0.04	1.90	0.90	0.89	1.03	1.28
ten-year	0.33	0.30	3.87		1.37		0.08	2.25	0.95	0.86	1.14	1.51

Notes:

1. Microtagged.

2. Carlin tagged, not corrected for tagging mortality.

3. Since 1999 only 1 year old smolts included.

4. Time-series mean.

5. Return rates to rod fishery with constant effort.

6. Different release sites.

Table 3.4.2.1. Probabilities that the forecast PFA for 1SW maturing and 1SW non-maturing fish will be greater than the age-specific Spawner Escapement Reserves (SERs) for the PFA years 2020 to 2024 for the Northern and Southern NEAC stock complexes.

	Southern NEAC		Northern NEAC	
	1SW Maturing	1SW Non-maturing	1SW Maturing	1SW Non-maturing
Spawner Escapement Reserve (SER)	**553 846**	**295 582**	**174 726**	**209 236**
PFA Year	**Probability of PFA meeting or exceeding SER**			
2020	0.714	0.979	0.994	0.999
2021	0.609	0.936	0.970	0.993
2022	0.442	0.836	0.938	0.978
2023	0.357	0.746	0.905	0.958
2024	0.519	0.826	0.871	0.934

Table 3.4.3.1. Probabilities that the forecast PFA for 1SW maturing and 1SW non-maturing fish will be greater than the age-specific Spawner Escapement Reserves (SERs) for the PFA years 2020 to 2024 for the Southern NEAC countries.

Maturing	France	Iceland-SW	Ireland	UK (England & Wales)	UK (N. Ireland)	UK (Scotland)
Spawner Escapement Reserve (SER)	22471	20566	269026	68682	42587	130514
PFA Year	Probability of PFA meeting or exceeding SER					
2020	0.226	0.805	0.262	0.197	0.455	0.902
2021	0.297	0.679	0.303	0.198	0.382	0.826
2022	0.400	0.593	0.254	0.220	0.302	0.698
2023	0.285	0.524	0.240	0.229	0.246	0.630
2024	0.321	0.421	0.323	0.338	0.336	0.675

Non-maturing	France	Iceland-SW	Ireland	UK (England & Wales)	UK (N. Ireland)	UK (Scotland)
Spawner Escapement Reserve (SER)	9451	2806	78294	51423	10316	143293
PFA Year	Probability of PFA meeting or exceeding SER					
2020	0.538	0.940	0.163	0.992	0.177	0.952
2021	0.567	0.853	0.231	0.966	0.198	0.891
2022	0.637	0.781	0.217	0.937	0.184	0.774
2023	0.490	0.724	0.219	0.904	0.167	0.699
2024	0.515	0.645	0.292	0.931	0.235	0.738

Table 3.4.3.2. Probabilities that the forecast PFA for 1SW maturing and 1SW non-maturing fish will be greater than the age-specific Spawner Escapement Reserves (SERs) for the PFA years 2020 to 2024 for Northern NEAC countries.

Maturing	Finland	Iceland-NE	Norway	Russia	Sweden
Spawner Escapement Reserve (SER)	18 174	6195	68 831	79 291	2235
PFA Year	Probability of PFA meeting or exceeding SER				
2020	0.351	0.889	0.998	0.513	0.646
2021	0.369	0.850	0.985	0.426	0.820
2022	0.377	0.746	0.971	0.283	0.818
2023	0.331	0.658	0.950	0.272	0.841
2024	0.284	0.602	0.917	0.368	0.828

Non-maturing	Finland	Iceland-NE	Norway	Russia	Sweden
Spawner Escapement Reserve (SER)	16 365	3182	123 036	61 918	4735
PFA Year	Probability of PFA meeting or exceeding SER				
2020	0.394	0.804	0.999	0.752	0.903
2021	0.402	0.778	0.992	0.618	0.956
2022	0.405	0.686	0.983	0.432	0.948
2023	0.355	0.607	0.967	0.403	0.950
2024	0.307	0.562	0.938	0.495	0.940

Table 3.5.1.1. Probability of Northern and Southern NEAC - 1SW and MSW stock complexes achieving their SERs independently and simultaneously for different catch options for the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons. Shaded cells denote achievement of SERs with ≥95% probability.

Catch options season	TAC option (t)	NEAC-N-1SW	NEAC-N-MSW	NEAC-S-1SW	NEAC-S-MSW	All complexes simultaneous
2021/2022	**0**	94 %	99 %	45 %	94 %	40 %
	20	94 %	98 %	44 %	92 %	38 %
	40	94 %	94 %	43 %	89 %	36 %
	60	94 %	87 %	42 %	87 %	32 %
	80	94 %	78 %	42 %	84 %	28 %
	100	94 %	67 %	41 %	81 %	23 %
	120	93 %	56 %	40 %	78 %	19 %
	140	93 %	46 %	40 %	75 %	15 %
	160	93 %	37 %	39 %	71 %	11 %
	180	93 %	29 %	38 %	68 %	9 %
	200	93 %	23 %	38 %	64 %	7 %
2022/2023	**0**	91 %	98 %	36 %	84 %	30 %
	20	91 %	94 %	35 %	80 %	28 %
	40	90 %	89 %	35 %	77 %	25 %
	60	90 %	81 %	34 %	73 %	22 %
	80	90 %	72 %	34 %	69 %	19 %
	100	90 %	63 %	33 %	66 %	15 %
	120	90 %	53 %	32 %	62 %	13 %
	140	90 %	45 %	32 %	58 %	10 %
	160	90 %	37 %	31 %	55 %	8 %
	180	90 %	31 %	31 %	51 %	6 %
	200	90 %	25 %	30 %	48 %	5 %
2023/2024	**0**	87 %	96 %	52 %	75 %	37 %
	20	87 %	91 %	52 %	71 %	34 %
	40	87 %	85 %	51 %	67 %	30 %
	60	87 %	77 %	51 %	63 %	26 %
	80	87 %	67 %	50 %	59 %	22 %
	100	86 %	59 %	50 %	56 %	18 %
	120	86 %	51 %	49 %	52 %	15 %
	140	86 %	43 %	49 %	49 %	12 %
	160	86 %	36 %	48 %	45 %	10 %
	180	86 %	30 %	47 %	42 %	8 %
	200	86 %	26 %	47 %	39 %	6 %

Table 3.5.1.2 Forecast exploitation rates for 1SW and MSW salmon from Northern and Southern NEAC areas in all fisheries (assuming full catch allocations are taken) for different TAC options in the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons.

Catch options season	TAC option (t)	NEAC-N-1SW	NEAC-N-MSW	NEAC-S-1SW	NEAC-S-MSW	All complexes simultaneous
2021/2022	**0**	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.8%	0.1%	0.3%	0.0%
	40	0.0%	1.6%	0.1%	0.6%	0.0%
	60	0.0%	2.4%	0.2%	0.9%	0.0%
	80	0.1%	3.1%	0.3%	1.2%	0.1%
	100	0.1%	3.9%	0.3%	1.5%	0.1%
	120	0.1%	4.7%	0.4%	1.7%	0.1%
	140	0.1%	5.5%	0.5%	2.0%	0.1%
	160	0.1%	6.3%	0.6%	2.3%	0.1%
	180	0.1%	7.1%	0.6%	2.6%	0.1%
	200	0.1%	7.9%	0.7%	2.9%	0.1%
2022/2023	**0**	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.8%	0.1%	0.4%	0.0%
	40	0.0%	1.6%	0.2%	0.7%	0.0%
	60	0.0%	2.4%	0.2%	1.0%	0.0%
	80	0.1%	3.2%	0.3%	1.4%	0.1%
	100	0.1%	4.0%	0.4%	1.7%	0.1%
	120	0.1%	4.8%	0.5%	2.1%	0.1%
	140	0.1%	5.6%	0.5%	2.4%	0.1%
	160	0.1%	6.4%	0.6%	2.8%	0.1%
	180	0.1%	7.2%	0.7%	3.1%	0.1%
	200	0.1%	8.0%	0.8%	3.5%	0.1%
2023/2024	**0**	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.8%	0.1%	0.4%	0.0%
	40	0.0%	1.7%	0.1%	0.8%	0.0%
	60	0.0%	2.5%	0.2%	1.2%	0.0%
	80	0.1%	3.3%	0.3%	1.6%	0.1%
	100	0.1%	4.1%	0.3%	2.0%	0.1%
	120	0.1%	5.0%	0.4%	2.3%	0.1%
	140	0.1%	5.8%	0.4%	2.7%	0.1%
	160	0.1%	6.6%	0.5%	3.1%	0.1%
	180	0.1%	7.4%	0.6%	3.5%	0.1%
	200	0.2%	8.3%	0.6%	3.9%	0.2%

Table 3.5.1.3 Probability (%) of National NEAC - 1SW stock complexes achieving their SERs individually and simultaneously for different catch options for the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons. Shaded cells denote achievement of SERs with ≥95% probability. MUs are management units.

Catch options season	TAC option (t)	Russia	Finland	Norway	Sweden	Iceland	UK (Scotland)	UK (N. Ireland)	Ireland	UK (England & Wales)	France	All 1SW MUs simultaneous
2021/ 2022	0	28 %	38 %	97 %	82 %	74 %	70 %	30 %	25 %	22 %	40 %	0.0%
	20	28 %	38 %	97 %	82 %	74 %	69 %	30 %	25 %	22 %	40 %	0.0%
	40	28 %	38 %	97 %	82 %	73 %	69 %	30 %	24 %	22 %	40 %	0.0%
	60	28 %	38 %	97 %	82 %	73 %	68 %	29 %	24 %	21 %	40 %	0.0%
	80	28 %	38 %	97 %	82 %	73 %	67 %	29 %	24 %	21 %	40 %	0.0%
	100	28 %	37 %	97 %	81 %	73 %	67 %	29 %	24 %	21 %	40 %	0.0%
	120	28 %	37 %	97 %	81 %	72 %	66 %	29 %	24 %	21 %	39 %	0.0%
	140	27 %	37 %	97 %	81 %	72 %	65 %	29 %	23 %	21 %	39 %	0.0%
	160	27 %	37 %	97 %	81 %	72 %	65 %	28 %	23 %	21 %	39 %	0.0%
	180	27 %	37 %	97 %	81 %	72 %	64 %	28 %	23 %	21 %	39 %	0.0%
	200	27 %	37 %	97 %	81 %	71 %	63 %	28 %	23 %	20 %	39 %	0.0%
2022/ 2023	0	27 %	33 %	95 %	84 %	66 %	63 %	25 %	24 %	23 %	28 %	0.0%
	20	27 %	33 %	95 %	84 %	65 %	63 %	25 %	24 %	23 %	28 %	0.0%
	40	27 %	33 %	95 %	84 %	65 %	62 %	24 %	24 %	23 %	28 %	0.0%
	60	27 %	33 %	95 %	84 %	65 %	61 %	24 %	23 %	22 %	28 %	0.0%
	80	27 %	33 %	94 %	84 %	65 %	61 %	24 %	23 %	22 %	28 %	0.0%
	100	27 %	33 %	94 %	84 %	64 %	60 %	24 %	23 %	22 %	28 %	0.0%
	120	26 %	33 %	94 %	84 %	64 %	60 %	24 %	23 %	22 %	28 %	0.0%
	140	26 %	33 %	94 %	84 %	64 %	59 %	23 %	23 %	22 %	28 %	0.0%
	160	26 %	32 %	94 %	84 %	64 %	58 %	23 %	22 %	22 %	27 %	0.0%
	180	26 %	32 %	94 %	84 %	63 %	58 %	23 %	22 %	21 %	27 %	0.0%
	200	26 %	32 %	94 %	84 %	63 %	57 %	23 %	22 %	21 %	27 %	0.0%
2023/ 2024	0	37 %	29 %	92 %	83 %	55 %	68 %	34 %	32 %	34 %	32 %	0.1%
	20	37 %	28 %	92 %	83 %	54 %	67 %	33 %	32 %	34 %	32 %	0.0%
	40	36 %	28 %	92 %	83 %	54 %	67 %	33 %	32 %	34 %	32 %	0.0%
	60	36 %	28 %	92 %	83 %	54 %	66 %	33 %	32 %	33 %	32 %	0.0%
	80	36 %	28 %	92 %	83 %	54 %	66 %	33 %	31 %	33 %	32 %	0.0%
	100	36 %	28 %	92 %	83 %	54 %	65 %	32 %	31 %	33 %	31 %	0.0%
	120	36 %	28 %	91 %	83 %	53 %	65 %	32 %	31 %	33 %	31 %	0.0%
	140	36 %	28 %	91 %	83 %	53 %	64 %	32 %	31 %	33 %	31 %	0.0%
	160	36 %	28 %	91 %	83 %	53 %	64 %	32 %	31 %	33 %	31 %	0.0%
	180	36 %	28 %	91 %	83 %	53 %	63 %	31 %	31 %	32 %	31 %	0.0%
	200	35 %	28 %	91 %	82 %	52 %	63 %	31 %	30 %	32 %	31 %	0.0%

Table 3.5.1.4 Probability (%) of National NEAC - MSW stock complexes achieving their SERs individually and simultaneously for different catch options for the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons. Shaded cells denote achievement of SERs with ≥95% probability. MUs are management units.

Catch options season	TAC option (t)	Russia	Finland	Norway	Sweden	Iceland	UK (Scotland)	UK (N. Ireland)	Ireland	UK (England & Wales)	France	All MSW MUs simultaneous
2021/ 2022	0	62 %	40 %	99 %	96 %	93 %	89 %	20 %	24 %	97 %	57 %	0.5%
	20	47 %	32 %	98 %	94 %	90 %	87 %	19 %	23 %	96 %	56 %	0.3%
	40	34 %	26 %	95 %	92 %	87 %	85 %	18 %	22 %	95 %	54 %	0.1%
	60	24 %	21 %	92 %	89 %	83 %	82 %	18 %	22 %	94 %	52 %	0.0%
	80	17 %	17 %	87 %	87 %	80 %	79 %	17 %	21 %	93 %	51 %	0.0%
	100	12 %	14 %	81 %	84 %	76 %	76 %	16 %	20 %	91 %	49 %	0.0%
	120	8 %	11 %	75 %	81 %	73 %	73 %	16 %	20 %	90 %	48 %	0.0%
	140	6 %	9 %	68 %	79 %	69 %	70 %	15 %	19 %	89 %	46 %	0.0%
	160	4 %	8 %	61 %	76 %	66 %	67 %	15 %	19 %	87 %	45 %	0.0%
	180	3 %	7 %	55 %	74 %	62 %	64 %	14 %	18 %	86 %	44 %	0.0%
	200	2 %	6 %	48 %	71 %	59 %	61 %	14 %	18 %	84 %	43 %	0.0%
2022/ 2023	0	43 %	41 %	98 %	95 %	87 %	78 %	18 %	22 %	94 %	64 %	0.2%
	20	31 %	34 %	96 %	93 %	83 %	74 %	18 %	21 %	92 %	63 %	0.1%
	40	21 %	28 %	93 %	91 %	80 %	71 %	17 %	21 %	91 %	62 %	0.0%
	60	15 %	24 %	89 %	89 %	76 %	67 %	16 %	20 %	90 %	60 %	0.0%
	80	10 %	20 %	85 %	87 %	72 %	64 %	16 %	20 %	89 %	59 %	0.0%
	100	7 %	17 %	80 %	84 %	69 %	60 %	15 %	19 %	87 %	58 %	0.0%
	120	5 %	15 %	74 %	82 %	65 %	57 %	15 %	19 %	86 %	57 %	0.0%
	140	4 %	13 %	68 %	80 %	62 %	53 %	15 %	18 %	84 %	55 %	0.0%
	160	3 %	11 %	63 %	78 %	59 %	50 %	14 %	18 %	83 %	54 %	0.0%
	180	2 %	10 %	57 %	76 %	56 %	47 %	14 %	18 %	81 %	53 %	0.0%
	200	1 %	8 %	52 %	73 %	53 %	43 %	13 %	17 %	80 %	52 %	0.0%
2023/ 2024	0	40 %	36 %	97 %	95 %	81 %	70 %	17 %	22 %	90 %	49 %	0.1%
	20	29 %	30 %	94 %	94 %	77 %	66 %	16 %	22 %	89 %	48 %	0.0%
	40	21 %	25 %	90 %	92 %	73 %	63 %	16 %	21 %	87 %	47 %	0.0%
	60	15 %	21 %	85 %	90 %	70 %	59 %	15 %	21 %	86 %	46 %	0.0%
	80	11 %	18 %	80 %	89 %	66 %	56 %	15 %	20 %	84 %	45 %	0.0%
	100	8 %	16 %	75 %	87 %	63 %	52 %	14 %	20 %	82 %	43 %	0.0%
	120	6 %	14 %	70 %	85 %	60 %	49 %	14 %	19 %	81 %	42 %	0.0%
	140	4 %	12 %	65 %	84 %	57 %	46 %	13 %	19 %	79 %	41 %	0.0%
	160	3 %	11 %	59 %	82 %	54 %	43 %	13 %	19 %	77 %	40 %	0.0%
	180	3 %	10 %	54 %	81 %	51 %	40 %	13 %	18 %	76 %	39 %	0.0%
	200	2 %	8 %	49 %	79 %	48 %	37 %	13 %	18 %	74 %	38 %	0.0%

Table 3.5.1.5. Forecast exploitation rates for 1SW salmon from Northern and Southern NEAC countries in all fisheries (assuming full catch allocations are taken) for different TAC options in the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons.

Catch options season	TAC option (t)	Russia	Finland	Norway	Sweden	Iceland	UK (Scotland)	UK (N. Ireland)	UK (England & Wales)	Ireland	France
2021 /2022	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%
	40	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%
	60	0.1%	0.1%	0.0%	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%
	80	0.1%	0.1%	0.0%	0.0%	0.1%	0.3%	0.3%	0.3%	0.2%	0.1%
	100	0.1%	0.1%	0.1%	0.0%	0.1%	0.4%	0.3%	0.3%	0.3%	0.1%
	120	0.2%	0.1%	0.1%	0.0%	0.1%	0.5%	0.4%	0.4%	0.4%	0.2%
	140	0.2%	0.1%	0.1%	0.0%	0.2%	0.5%	0.5%	0.5%	0.4%	0.2%
	160	0.2%	0.1%	0.1%	0.0%	0.2%	0.6%	0.5%	0.5%	0.5%	0.2%
	180	0.2%	0.2%	0.1%	0.1%	0.2%	0.7%	0.6%	0.6%	0.5%	0.2%
	200	0.2%	0.2%	0.1%	0.1%	0.2%	0.8%	0.6%	0.7%	0.6%	0.3%
2022 /2023	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%
	40	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%
	60	0.1%	0.1%	0.0%	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%
	80	0.1%	0.1%	0.0%	0.0%	0.1%	0.3%	0.3%	0.3%	0.2%	0.1%
	100	0.1%	0.1%	0.1%	0.0%	0.1%	0.4%	0.4%	0.3%	0.3%	0.2%
	120	0.2%	0.1%	0.1%	0.0%	0.1%	0.5%	0.4%	0.4%	0.4%	0.2%
	140	0.2%	0.1%	0.1%	0.0%	0.2%	0.6%	0.5%	0.4%	0.4%	0.2%
	160	0.2%	0.1%	0.1%	0.0%	0.2%	0.7%	0.6%	0.5%	0.5%	0.3%
	180	0.2%	0.2%	0.1%	0.0%	0.2%	0.7%	0.6%	0.6%	0.5%	0.3%
	200	0.3%	0.2%	0.1%	0.0%	0.2%	0.8%	0.7%	0.6%	0.6%	0.3%
2023 /2024	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
	40	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	60	0.1%	0.1%	0.0%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
	80	0.1%	0.1%	0.0%	0.0%	0.1%	0.3%	0.2%	0.2%	0.2%	0.1%
	100	0.1%	0.1%	0.1%	0.0%	0.1%	0.3%	0.2%	0.2%	0.2%	0.1%
	120	0.1%	0.1%	0.1%	0.0%	0.2%	0.4%	0.3%	0.2%	0.3%	0.2%
	140	0.2%	0.1%	0.1%	0.0%	0.2%	0.5%	0.3%	0.3%	0.3%	0.2%
	160	0.2%	0.2%	0.1%	0.0%	0.2%	0.5%	0.4%	0.3%	0.3%	0.2%
	180	0.2%	0.2%	0.1%	0.0%	0.2%	0.6%	0.4%	0.4%	0.4%	0.2%
	200	0.2%	0.2%	0.1%	0.0%	0.3%	0.7%	0.5%	0.4%	0.4%	0.2%

Table 3.5.1.6. Forecast exploitation rates for MSW salmon from Northern and Southern NEAC countries in all fisheries (assuming full catch allocations are taken) for different TAC options in the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons.

Catch options seasons	TAC option (t)	Russia	Finland	Norway	Sweden	Iceland	UK (Scotland)	UK (N. Ireland)	UK (England & Wales)	Ireland	France
2021 /2022	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	1.3%	1.4%	0.6%	0.2%	0.3%	0.3%	0.4%	0.2%	0.2%	0.2%
	40	2.5%	2.8%	1.2%	0.5%	0.7%	0.6%	0.8%	0.3%	0.5%	0.4%
	60	3.8%	4.1%	1.7%	0.7%	1.0%	0.9%	1.1%	0.5%	0.7%	0.6%
	80	5.0%	5.5%	2.3%	0.9%	1.4%	1.2%	1.5%	0.6%	0.9%	0.8%
	100	6.2%	6.9%	2.9%	1.2%	1.7%	1.5%	1.9%	0.8%	1.1%	1.0%
	120	7.5%	8.3%	3.5%	1.4%	2.0%	1.9%	2.3%	0.9%	1.4%	1.2%
	140	8.7%	9.6%	4.0%	1.6%	2.4%	2.2%	2.7%	1.1%	1.6%	1.3%
	160	10.0%	11.0%	4.6%	1.8%	2.7%	2.5%	3.1%	1.3%	1.8%	1.5%
	180	11.2%	12.4%	5.2%	2.1%	3.1%	2.8%	3.4%	1.4%	2.1%	1.7%
	200	12.5%	13.8%	5.8%	2.3%	3.4%	3.1%	3.8%	1.6%	2.3%	1.9%
2022 /2023	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	1.5%	1.3%	0.5%	0.2%	0.3%	0.4%	0.4%	0.2%	0.2%	0.1%
	40	3.0%	2.5%	1.1%	0.4%	0.7%	0.8%	0.8%	0.3%	0.5%	0.2%
	60	4.6%	3.8%	1.6%	0.5%	1.0%	1.2%	1.2%	0.5%	0.7%	0.4%
	80	6.1%	5.0%	2.1%	0.7%	1.4%	1.5%	1.5%	0.6%	0.9%	0.5%
	100	7.6%	6.3%	2.6%	0.9%	1.7%	1.9%	1.9%	0.8%	1.2%	0.6%
	120	9.1%	7.5%	3.2%	1.1%	2.0%	2.3%	2.3%	0.9%	1.4%	0.7%
	140	10.6%	8.8%	3.7%	1.3%	2.4%	2.7%	2.7%	1.1%	1.6%	0.8%
	160	12.2%	10.0%	4.2%	1.4%	2.7%	3.1%	3.1%	1.2%	1.8%	0.9%
	180	13.7%	11.3%	4.7%	1.6%	3.0%	3.5%	3.5%	1.4%	2.1%	1.1%
	200	15.2%	12.5%	5.3%	1.8%	3.4%	3.8%	3.9%	1.6%	2.3%	1.2%
2023 /2024	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	20	1.6%	1.3%	0.5%	0.1%	0.3%	0.4%	0.4%	0.2%	0.2%	0.2%
	40	3.1%	2.6%	1.1%	0.2%	0.7%	0.9%	0.8%	0.3%	0.4%	0.3%
	60	4.7%	3.9%	1.6%	0.3%	1.0%	1.3%	1.2%	0.5%	0.6%	0.5%
	80	6.2%	5.2%	2.1%	0.4%	1.3%	1.7%	1.6%	0.6%	0.9%	0.6%
	100	7.8%	6.5%	2.6%	0.6%	1.7%	2.1%	2.0%	0.8%	1.1%	0.8%
	120	9.3%	7.8%	3.1%	0.7%	2.0%	2.5%	2.4%	1.0%	1.3%	0.9%
	140	10.9%	9.1%	3.7%	0.8%	2.4%	3.0%	2.8%	1.1%	1.5%	1.1%
	160	12.4%	10.4%	4.2%	0.9%	2.7%	3.4%	3.2%	1.3%	1.7%	1.2%
	180	14.0%	11.7%	4.7%	1.0%	3.0%	3.8%	3.6%	1.4%	1.9%	1.4%
	200	15.5%	13.0%	5.2%	1.1%	3.4%	4.2%	4.0%	1.6%	2.1%	1.5%

Table 3.6.2.1. Summary statistics for the regressions for candidate Northern NEAC stock complex indicators for inclusion in the updated Framework of Indicators (shading denotes retained indicators).

Summary Northern NEAC Stock complex indicators, 1SW					
Candidate indicator dataset	N	r^2	Significant?	$r^2 > .2$	Comments
Returns all 1SW NO PFA est	37	0.92	significant at p 0.05	yes	
Survivals W 1SW NO Imsa	38	0.47	significant at p 0.05	yes	
Counts all NO Nausta	23	0.22	significant at p 0.05	yes	
Counts all NO Øyensåa	22	0.10	not significant at p 0.05	no	
Survivals H 1SW NO Imsa	37	0.31	significant at p 0.05	yes	
Catch rT&N 1SW FI	22	0.51	significant at p 0.05	yes	
Counts 1SW RU Tuloma	28	0.04	not significant at p 0.05	no	Not updated
Tot catch 1SW Teno/Tana	38	0.26	significant at p 0.05	yes	Fulfilled criteria, but not included in FWI
Counts 1 SW Utsjoki	19	0.07	not significant at p 0.05	no	
Counts 1 SW Pulmankjoki	18	0.06	not significant at p 0.05	no	
Counts 1SW Akujoki	18	0.38	significant at p 0.05	yes	

Summary Northern NEAC Stock complex indicators, MSW					
Candidate indicator dataset	N	r^2	Significant?	$r^2 > .2$	Comments
Returns all 2SW NO PFA est	27	0.31	significant at p 0.05	yes	
PFA MSW Coast NO	37	0.79	significant at p 0.05	yes	
Counts all NO Orkla	17	0.55	significant at p 0.05	yes	Not updated
Counts all NO Nausta	23	0.33	significant at p 0.05	yes	
Counts all NO Målselv	30	0.00	not significant at p 0.05	no	
Counts MSW RU Tuloma	27	0.13	not significant at p 0.05	no	Not updated
Catch W rT&N 2SW FI	22	0.36	significant at p 0.05	yes	
Tot catch MSW Teno/Tana	35	0.07	not significant at p 0.05	no	
Counts MSW M Utsjoki	19	0.002	not significant at p 0.05	no	

Table 3.6.2.2. Summary statistics for the regressions for candidate Southern NEAC stock complex indicators for inclusion in the updated Framework of Indicators (shading denotes retained indicators).

Summary Southern NEAC Stock complex indicators 1SW					
Candidate indicator dataset	N	r^2	Significant?	$r^2 > .2$	Comments
Ret. W 1SW UK(Sc.) North Esk M	40	0.68	significant at p 0.05	yes	
Ret. W 1SW UK(E&W) Itchen M	33	0.09	not significant at p 0.05	no	
Ret. W 1SW UK(E&W) Frome M	48	0.43	significant at p 0.05	yes	
Ret. Freshw 1SW UK(NI) Bush	46	0.29	significant at p 0.05	yes	
Surv FW 1SW UK(NI) Bush	37	0.17	significant at p 0.05	no	
Surv 1SW UK(NI) Bush M	32	0.64	significant at p 0.05	yes	
Surv coast 1SW UK(E&W) Dee M	24	0.35	significant at p 0.05	yes	
Ret. W 1SW UK(E&W) Test M	33	0.00	not significant at p 0.05	no	
Ret. W 1SW UK(E&W) Dee M	29	0.58	significant at p 0.05	yes	
Ret. W 1SW UK(E&W) Tamar M	27	0.31	significant at p 0.05	yes	
Ret. 1SW UK(E&W) Lune M	28	0.08	not significant at p 0.05	no	Not updated
Count 1SW UK(E&W) Fowey M	26	0.30	significant at p 0.05	yes	NEW
Ret. Riv 1SW UK(Sc.) North Esk	40	0.08	not significant at p 0.05	no	
Ret. 1SW UK(E&W) Kent	22	0.01	not significant at p 0.05	no	Not updated
Ret. 1SW UK(E&W) Leven	17	0.04	not significant at p 0.05	no	
Ret. 1SW UK(E&W) H-Avon	15	0.01	not significant at p 0.05	no	
Surv 1SW UK(E&W) Frome	17	0.32	significant at p 0.05	yes	

Summary Southern NEAC Stock complex indicators MSW					
Candidate indicator dataset	N	r^2	Significant?	$r^2 > .2$	Comments
Ret. W MSW UK(E&W) Itchen NM	33	0.26	significant at p 0.05	yes	
Catch W MSW Ice Ellidaar NM	49	0.53	significant at p 0.05	yes	
Ret. W 2SW UK(Sc.) Baddoch NM	33	0.37	significant at p 0.05	yes	
Ret. W MSW UK(E&W) Frome NM	48	0.31	significant at p 0.05	yes	
Ret. W 1SW UK(E&W) Tamar NM	27	0.05	not significant at p 0.05	no	
Ret. W 1SW UK(E&W) Frome NM	47	0.22	significant at p 0.05	yes	
Ret. MSW UK(E&W) Lune NM	28	0.16	significant at p 0.05	no	Not updated
Ret. W 1SW UK(Sc.) North Esk NM	39	0.25	significant at p 0.05	yes	NEW
Ret. W 1SW UK(E&W) Itchen NM	32	0.41	significant at p 0.05	yes	
Ret. Freshw 2SW UK(NI) Bush	45	0.14	significant at p 0.05	no	
Count MSW UK(E&W) Fowey NM	26	0.04	not significant at p 0.05	no	
Ret. W 2SW UK(Sc.) North Esk NM	40	0.53	significant at p 0.05	yes	
Ret. W 2SW UK(Sc.) Girnoch NM	49	0.40	significant at p 0.05	yes	
Ret. W MSW UK(E&W) Test NM	33	0.00	not significant at p 0.05	no	
Count 1SW UK(E&W) Fowey NM	25	0.08	not significant at p 0.05	no	
Ret. W 1SW UK(E&W) Dee NM	28	0.00	not significant at p 0.05	no	
Ret. W All UK(Sc.) West water NM	27	0.04	not significant at p 0.05	no	
Ret. W 1SW UK(E&W) Test NM	32	0.13	significant at p 0.05	no	
Survival coast 1SW UK(E&W) Dee NM	23	0.00	not significant at p 0.05	no	
Ret. W All UK(Sc.) West water M	27	0.12	not significant at p 0.05	no	
Ret. W MSW UK(E&W) Dee NM	29	0.12	not significant at p 0.05	no	
Ret. W MSW UK(E&W) Tamar NM	27	0.16	significant at p 0.05	no	
Survival coast MSW UK(E&W) Dee NM	23	0.04	not significant at p 0.05	no	
Ret. Riv MSW UK(Sc.) North Esk	39	0.02	not significant at p 0.05	no	
Ret. MSW UK(E&W) Kent	22	0.02	not significant at p 0.05	no	Not updated
Counts. MSW UK(E&W) Leven	17	0.08	not significant at p 0.05	no	
Ret. MSW UK(E&W) H-Avon	15	0.00	not significant at p 0.05	no	
Ret. MSW UK(E&W) Frome	16	0.12	not significant at p 0.05	no	

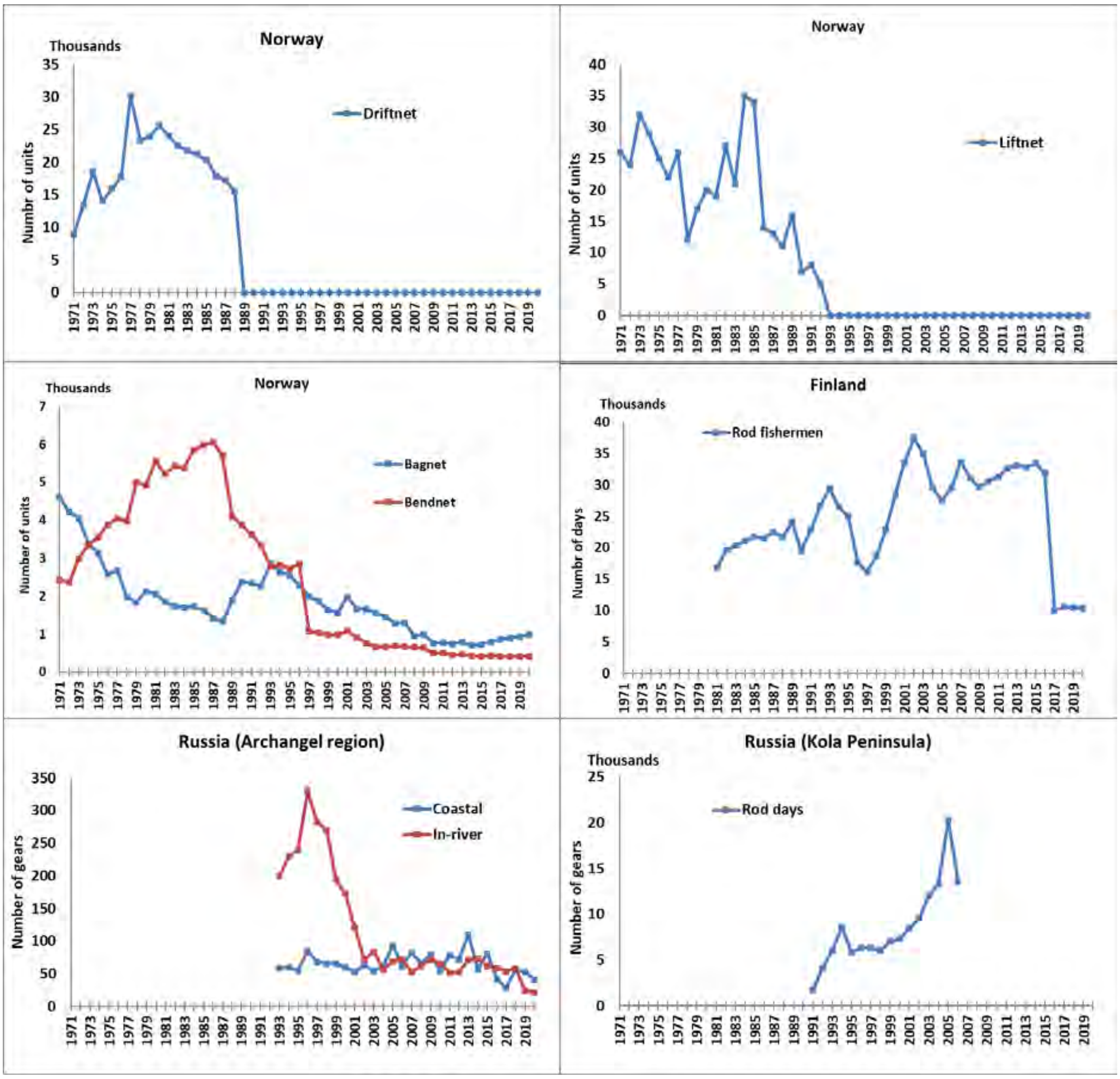


Figure 3.1.3.1. Overview of effort as reported for various fisheries and countries in the Northern NEAC area, 1971–2020. Notice that some of the y-axes are given in thousands.

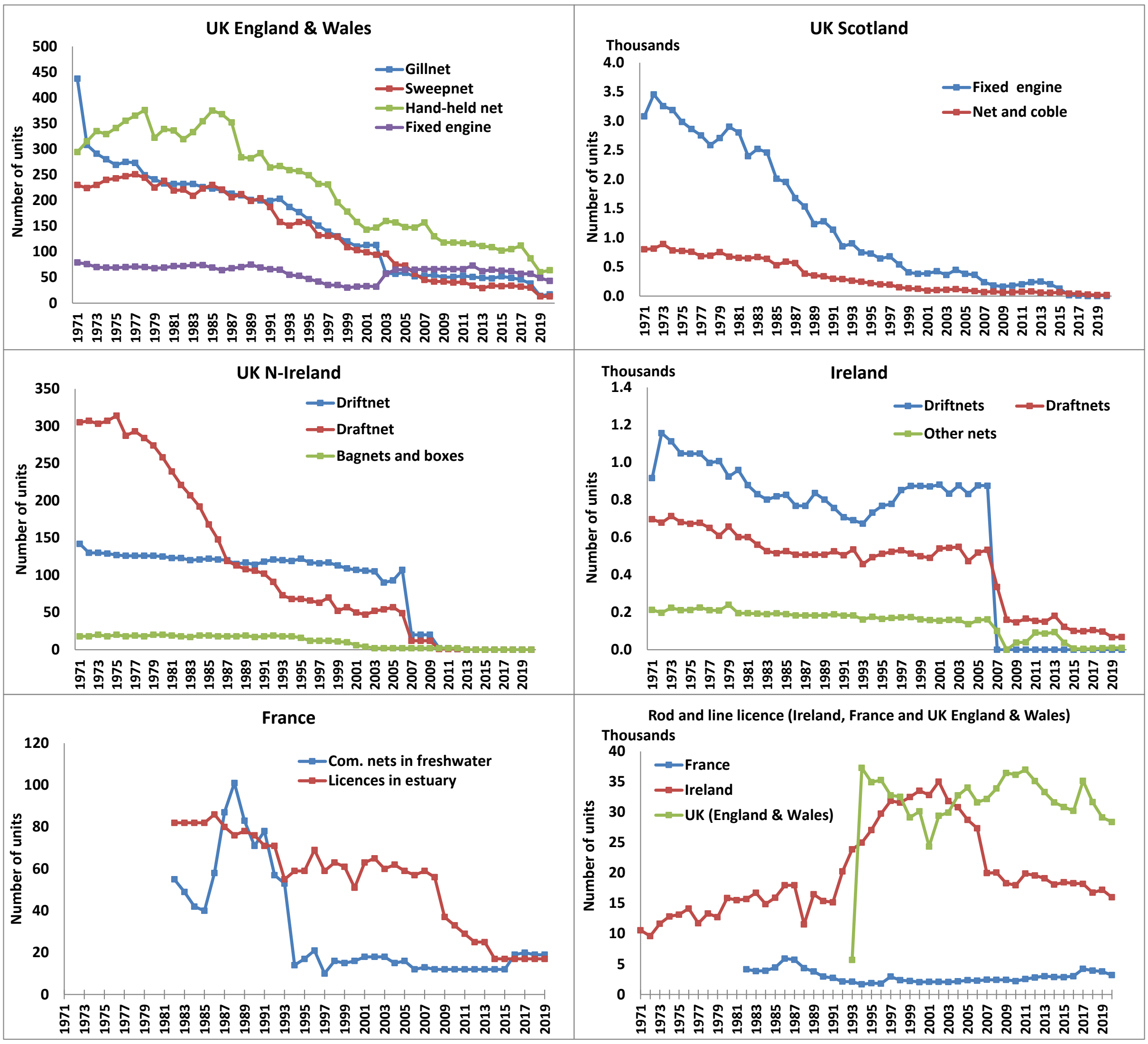


Figure 3.1.3.2. Overview of effort as reported for various fisheries and countries in the Southern NEAC area, 1971–2020. Notice all the y-axes on the right panel are given in thousands.

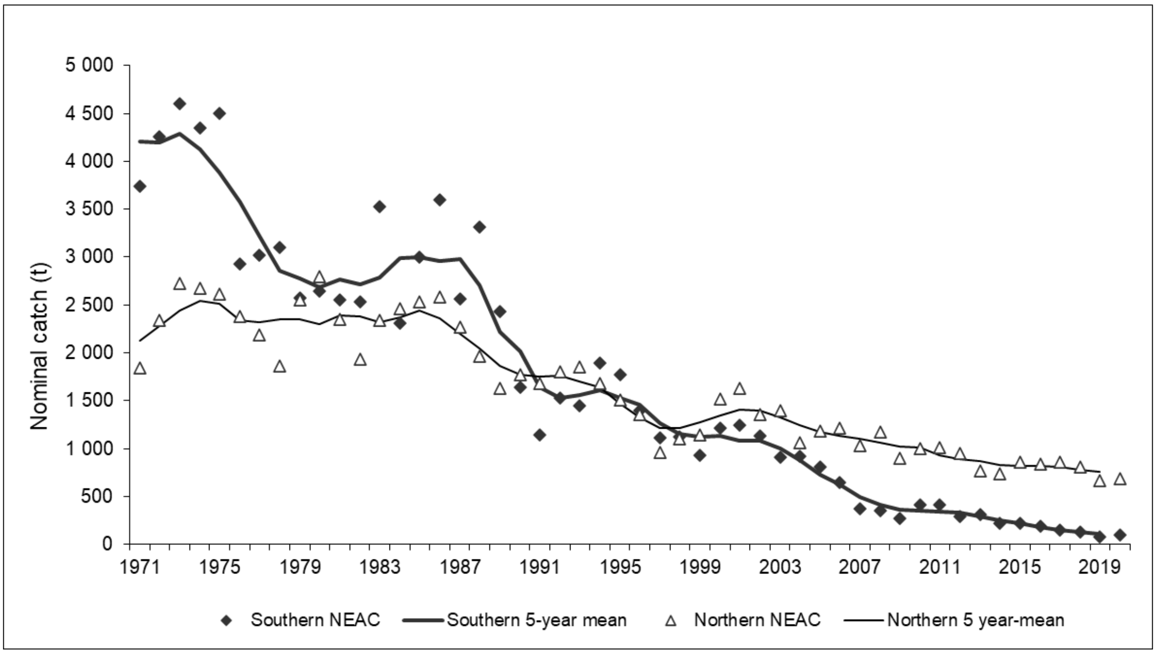


Figure 3.1.4.1. Nominal catches of salmon and 5-year running means in the Southern and Northern NEAC areas, 1971–2020.

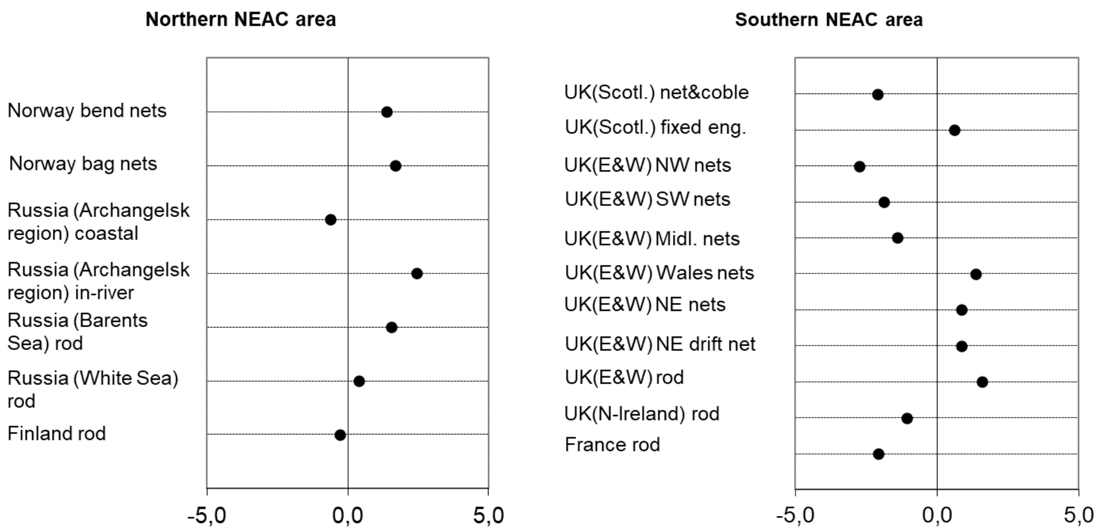


Figure 3.1.5.1. Proportional change (%) over years in CPUE estimates in various rod and net fisheries in Northern and Southern NEAC area.

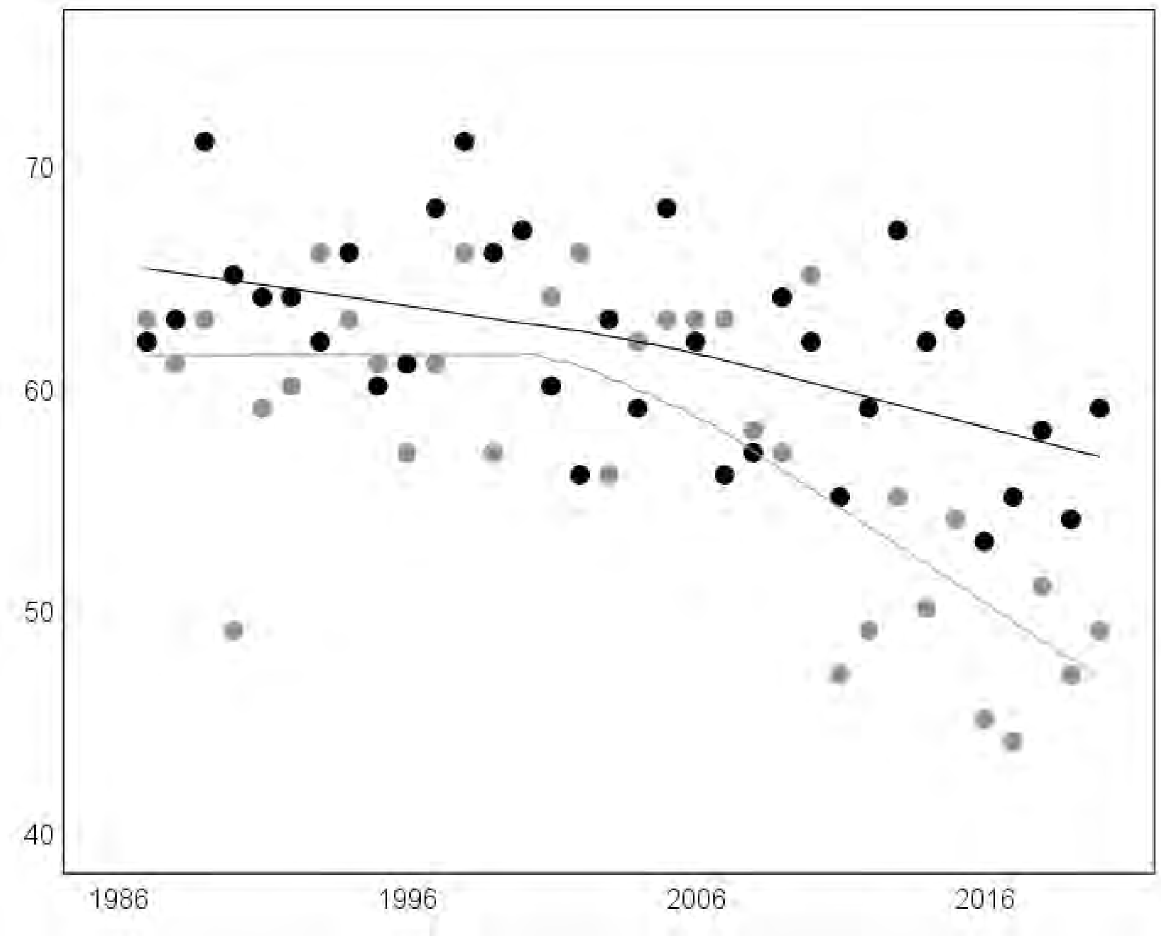


Figure 3.1.6.1. Percentage of 1SW salmon in the reported catch for the Northern (black dots) and Southern (grey dots) stock complexes, 1987–2020. Curves represent Northern (black line) and Southern (grey line) stock complexes with a Loess smoother (span =85%) applied to the data.

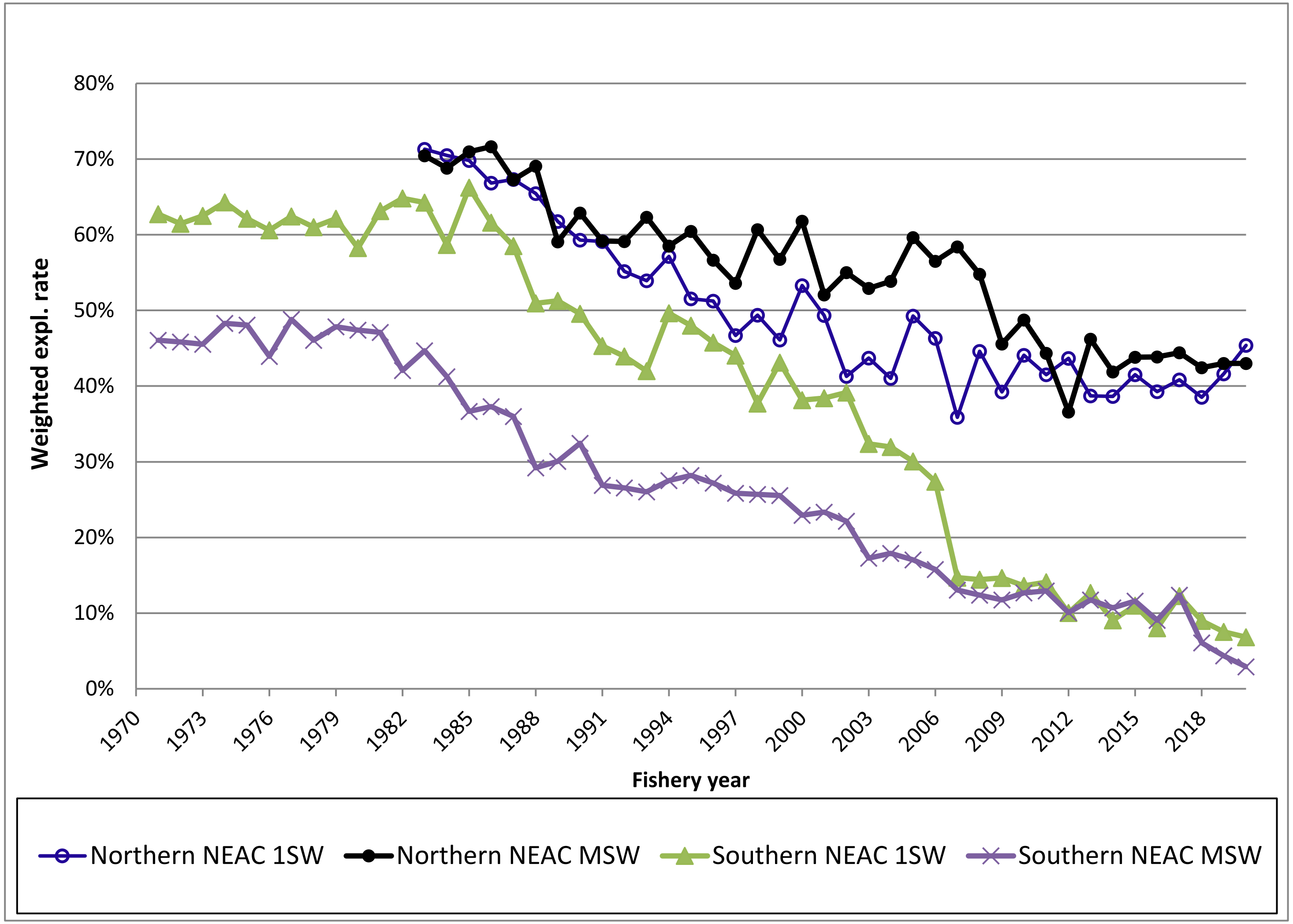


Figure 3.1.9.1. Mean annual exploitation rate of wild 1SW and MSW salmon by fisheries in Northern and Southern NEAC countries.

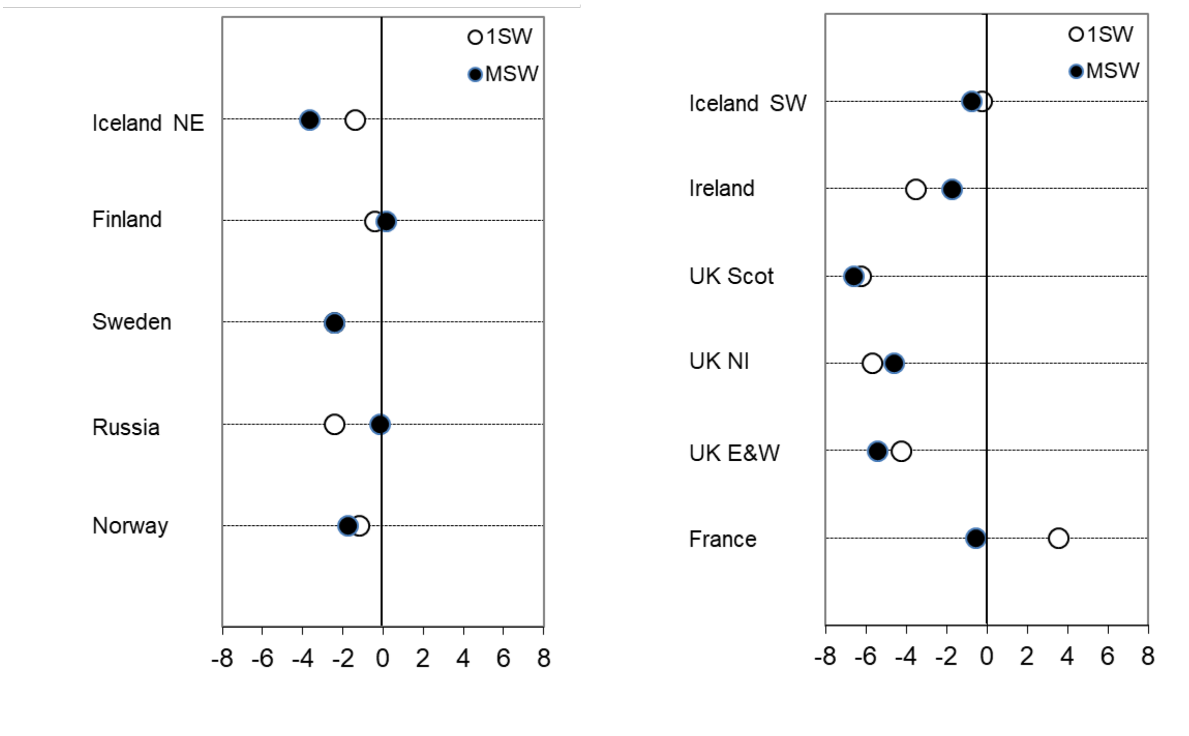


Figure 3.1.9.2. The rate of change (%) of exploitation of 1SW and MSW salmon in Northern NEAC (left) and Southern NEAC (right) countries.

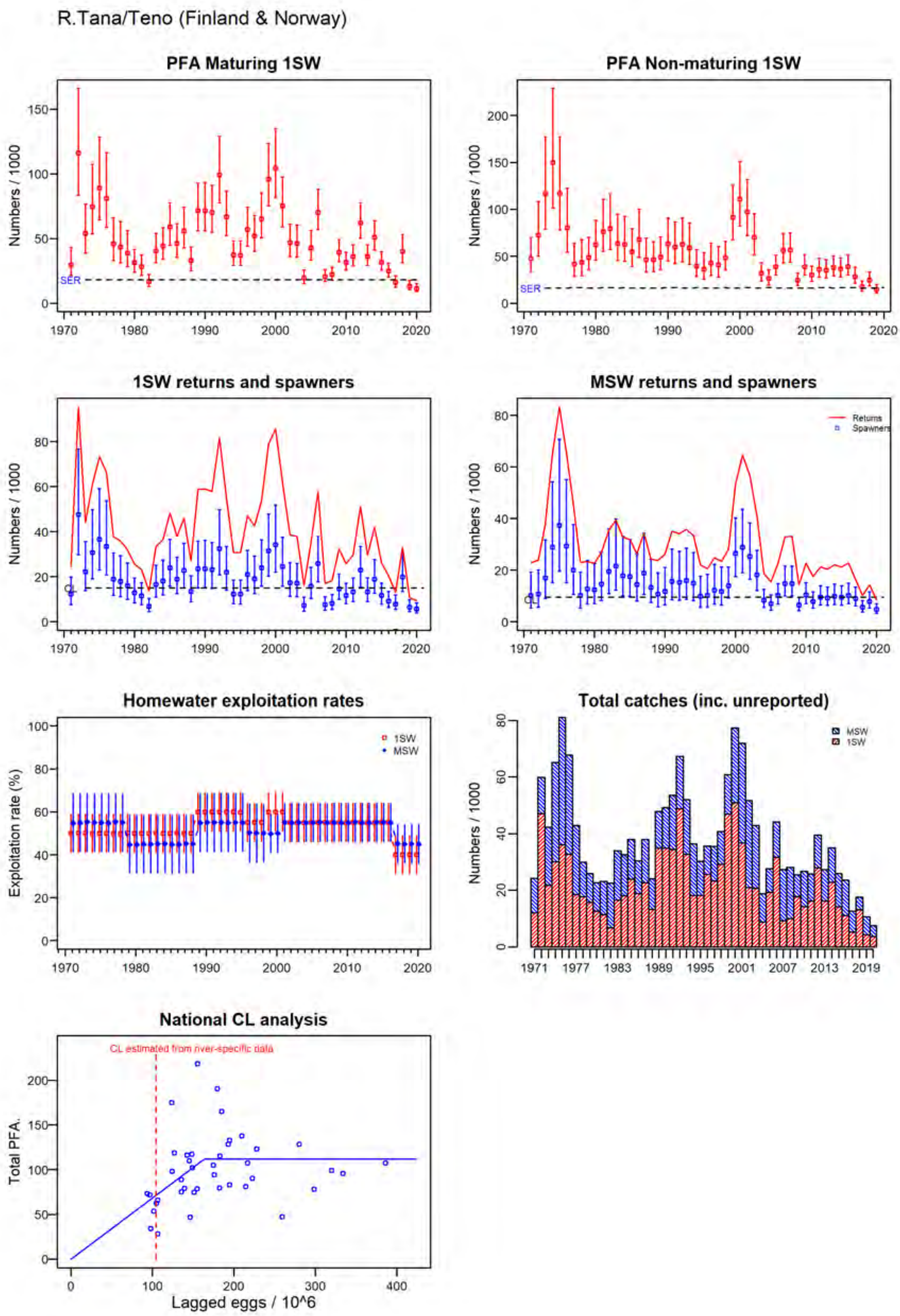


Figure 3.3.4.1a. Summary of fisheries and stock description, River Teno / Tana (Finland and Norway combined). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection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

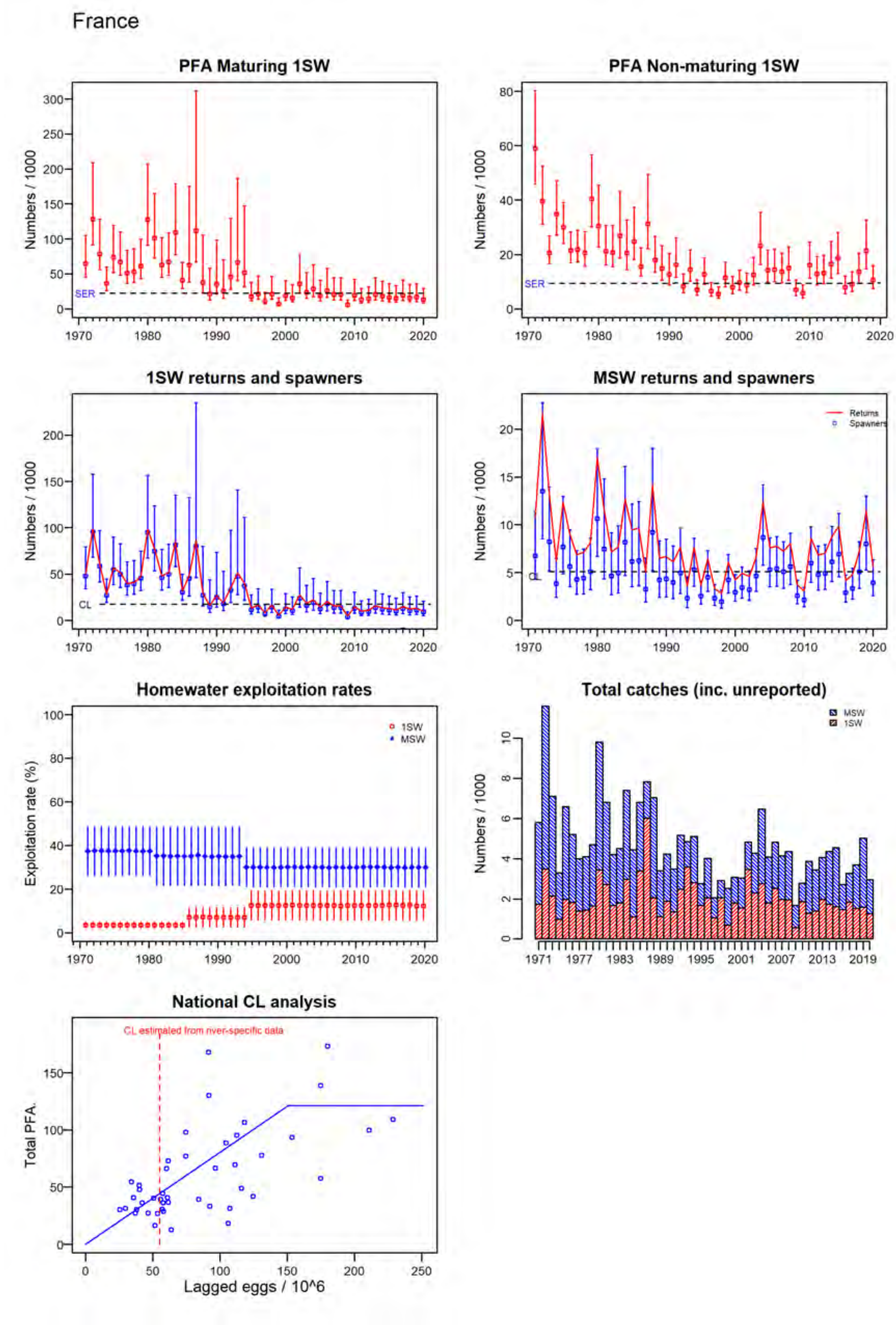


Figure 3.3.4.1b. Summary of fisheries and stock description, France. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

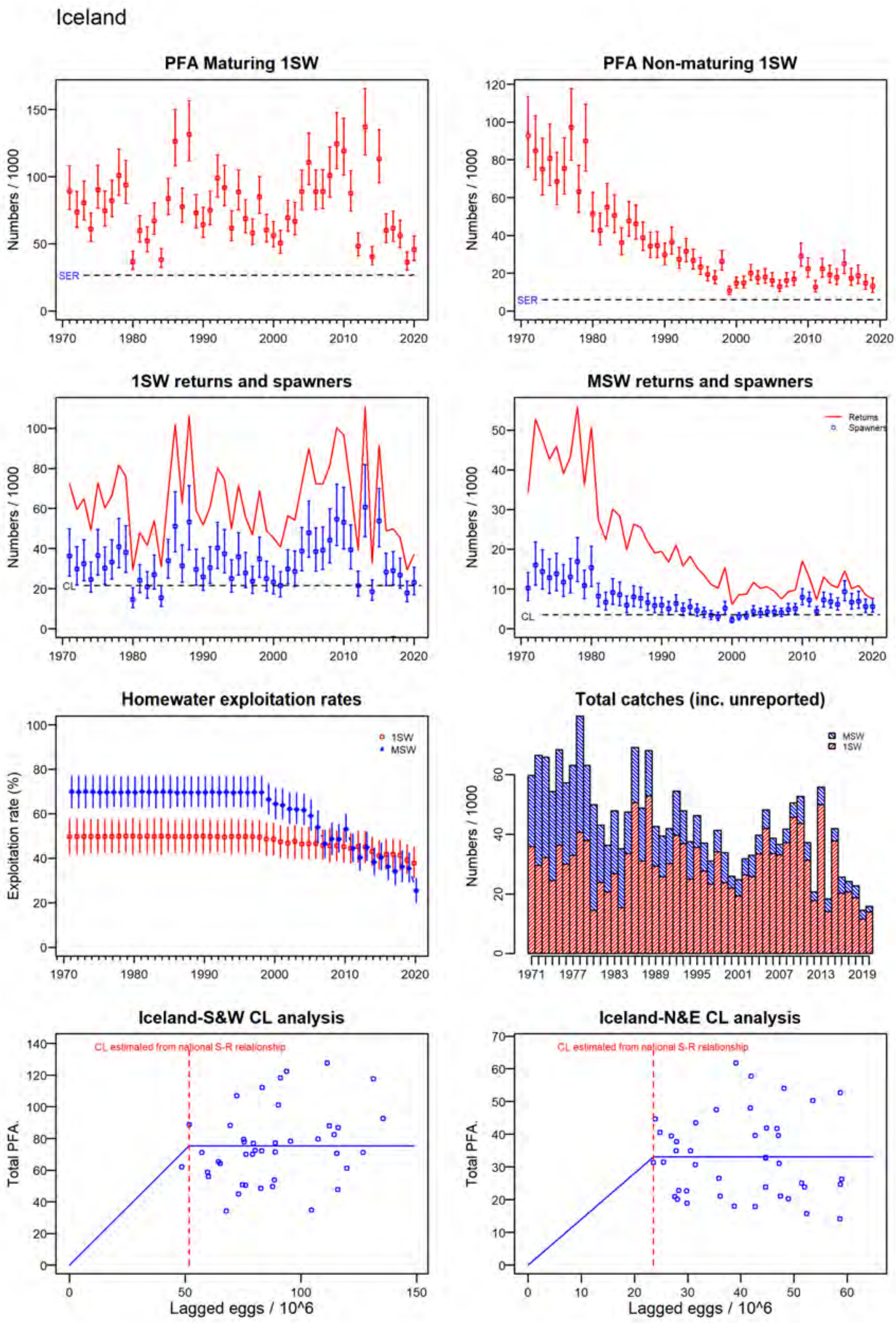


Figure 3.3.4.1c. Summary of fisheries and stock description, Iceland. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

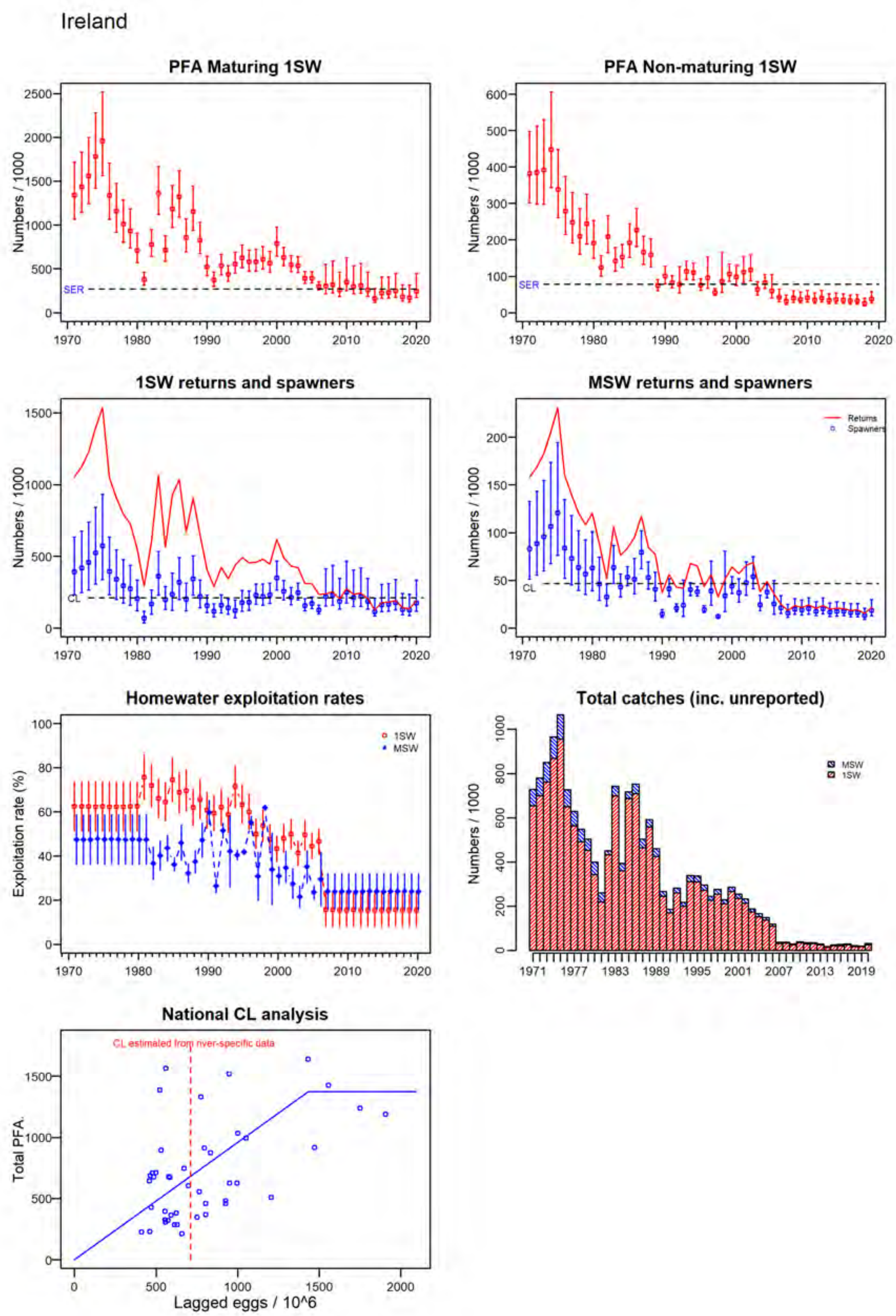


Figure 3.3.4.1d. Summary of fisheries and stock description, Ireland. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

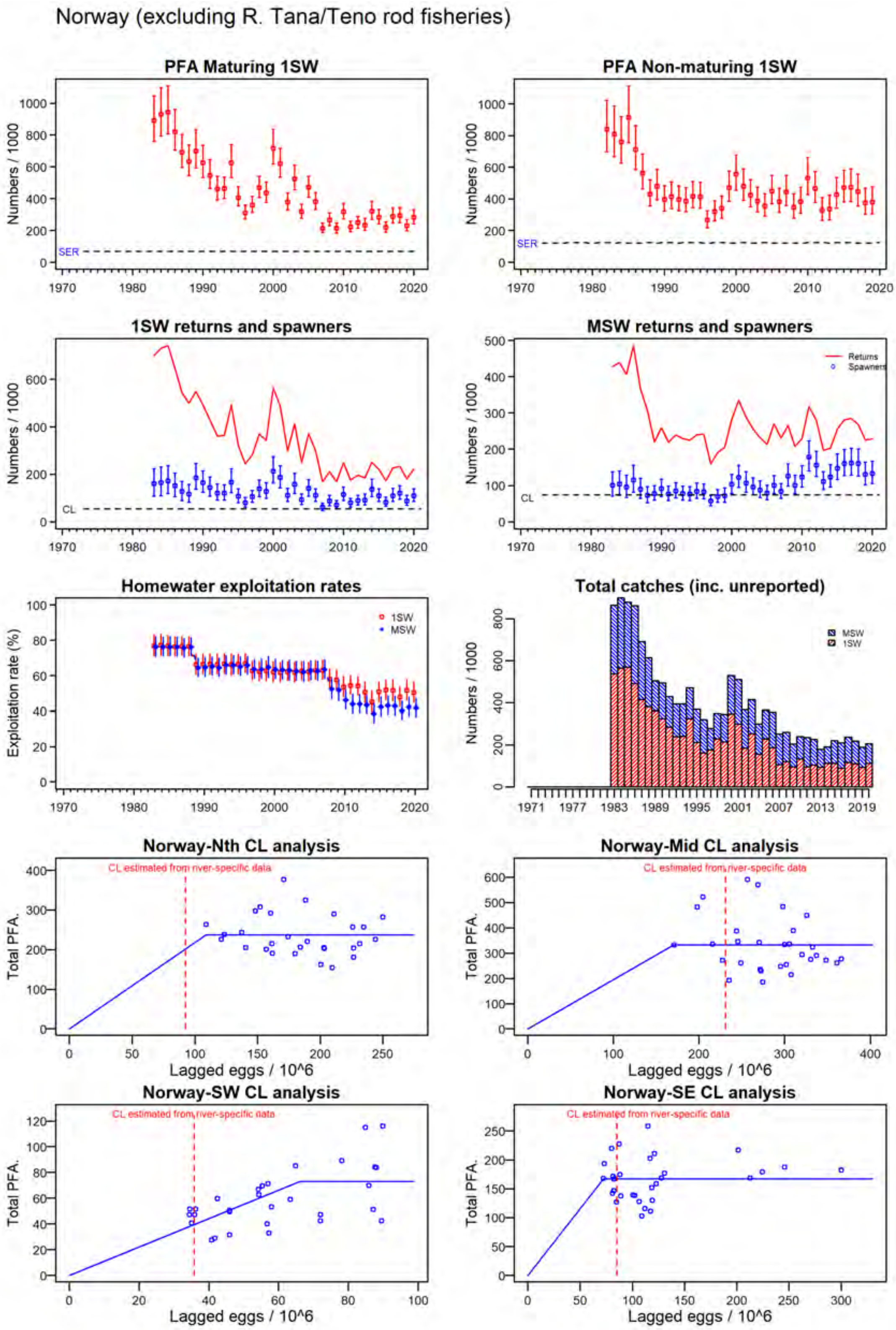


Figure 3.3.4.1e. Summary of fisheries and stock description, Norway (minus Norwegian catches from the R. Teno / Tana). The river-specific CLs, which are used for assessment purposes, are included on the regional CL analysis plots (for comparison, the CLs estimated from the regional S–R relationships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

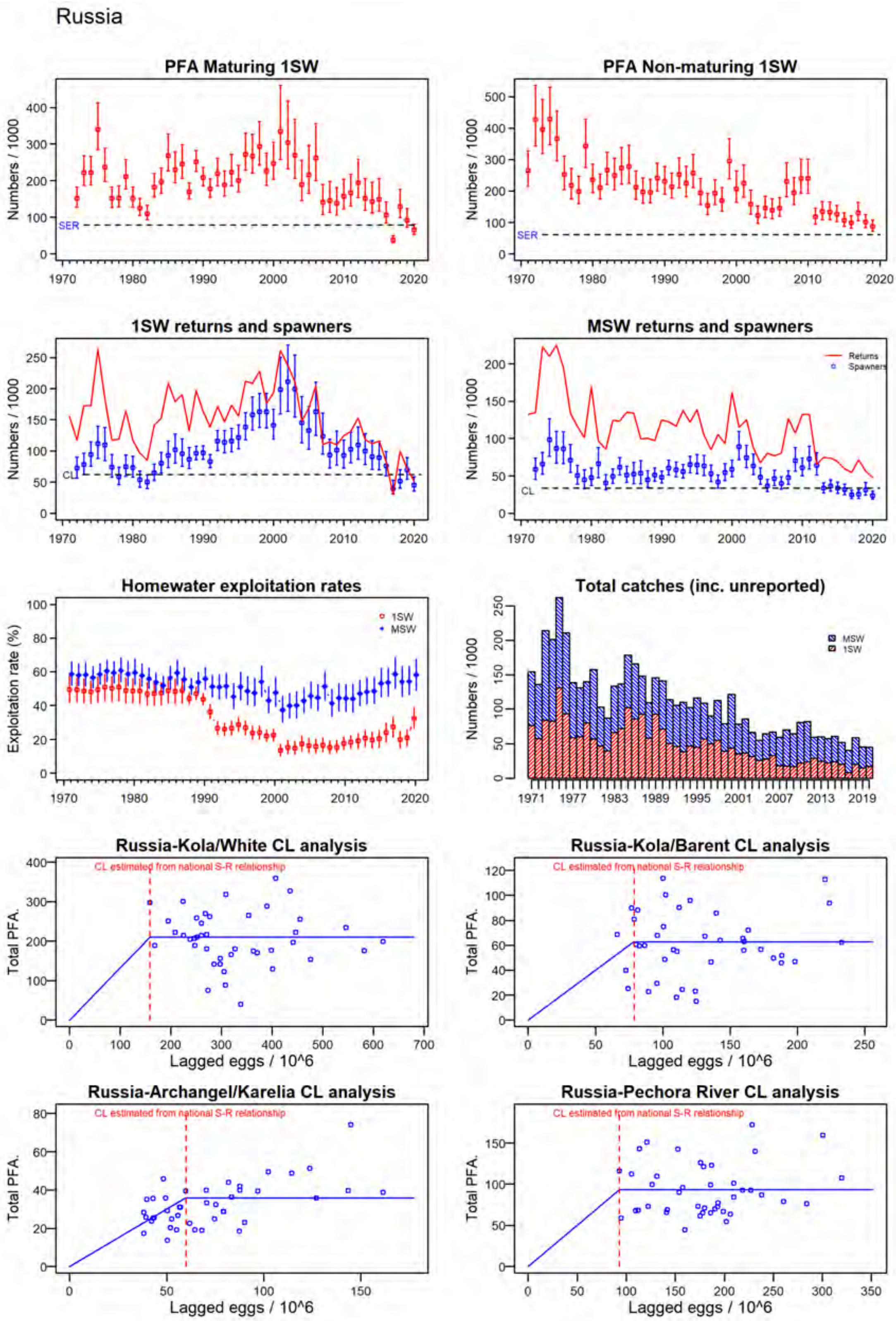


Figure 3.3.4.1f. Summary of fisheries and stock description, Russia. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

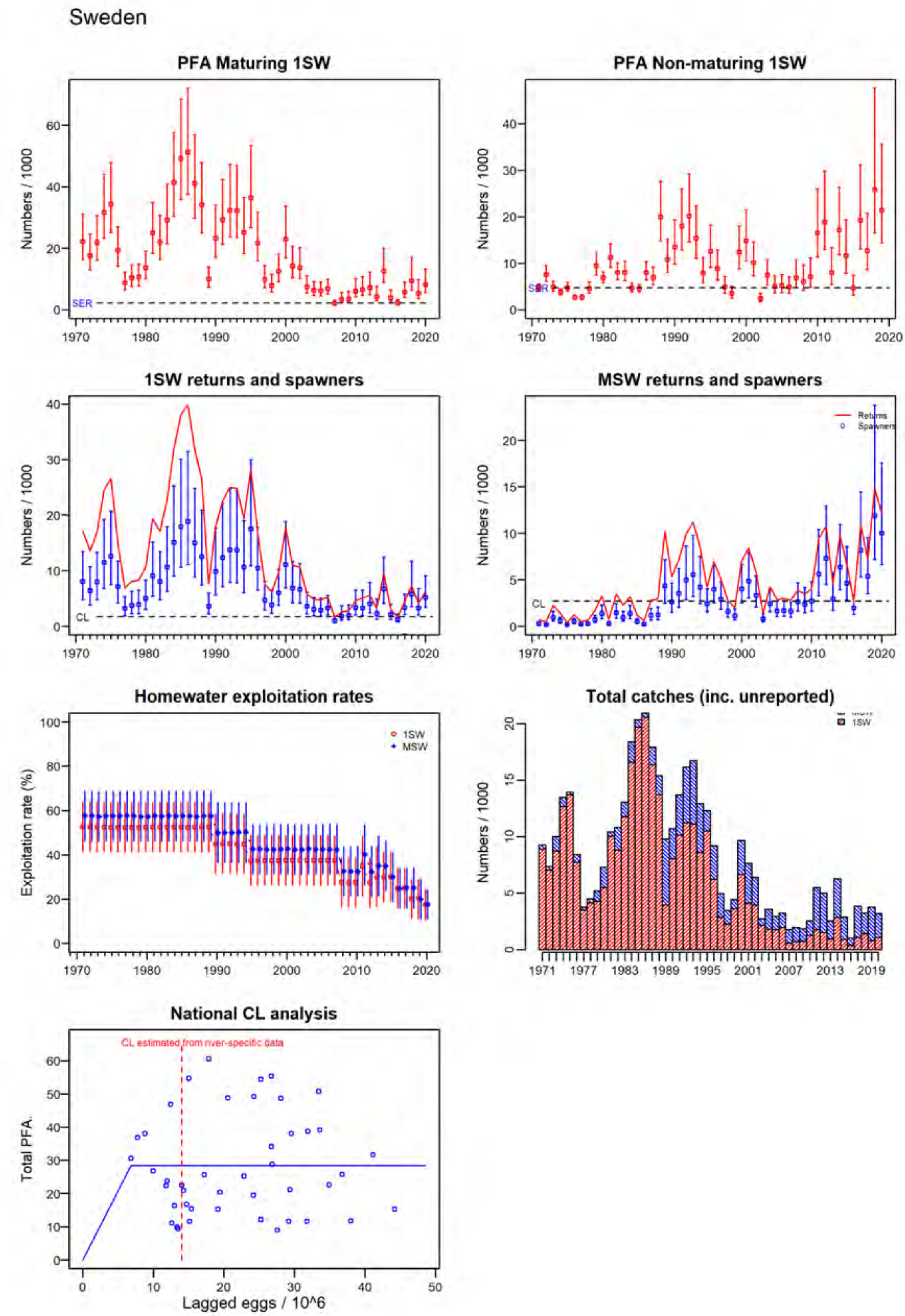


Figure 3.3.4.1g. Summary of fisheries and stock description, Sweden. The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

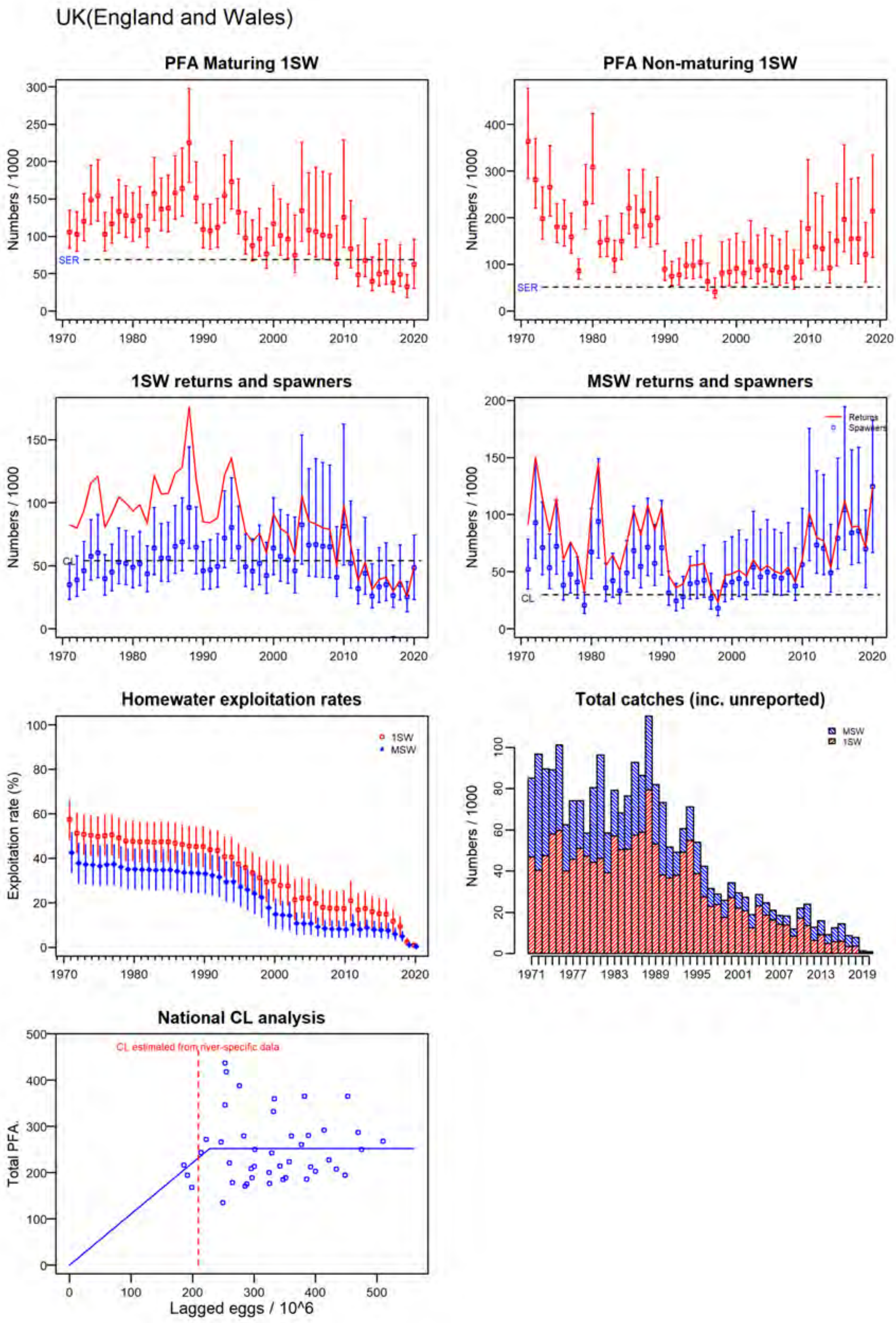


Figure 3.3.4.1h. Summary of fisheries and stock description, UK (England & Wales). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point).

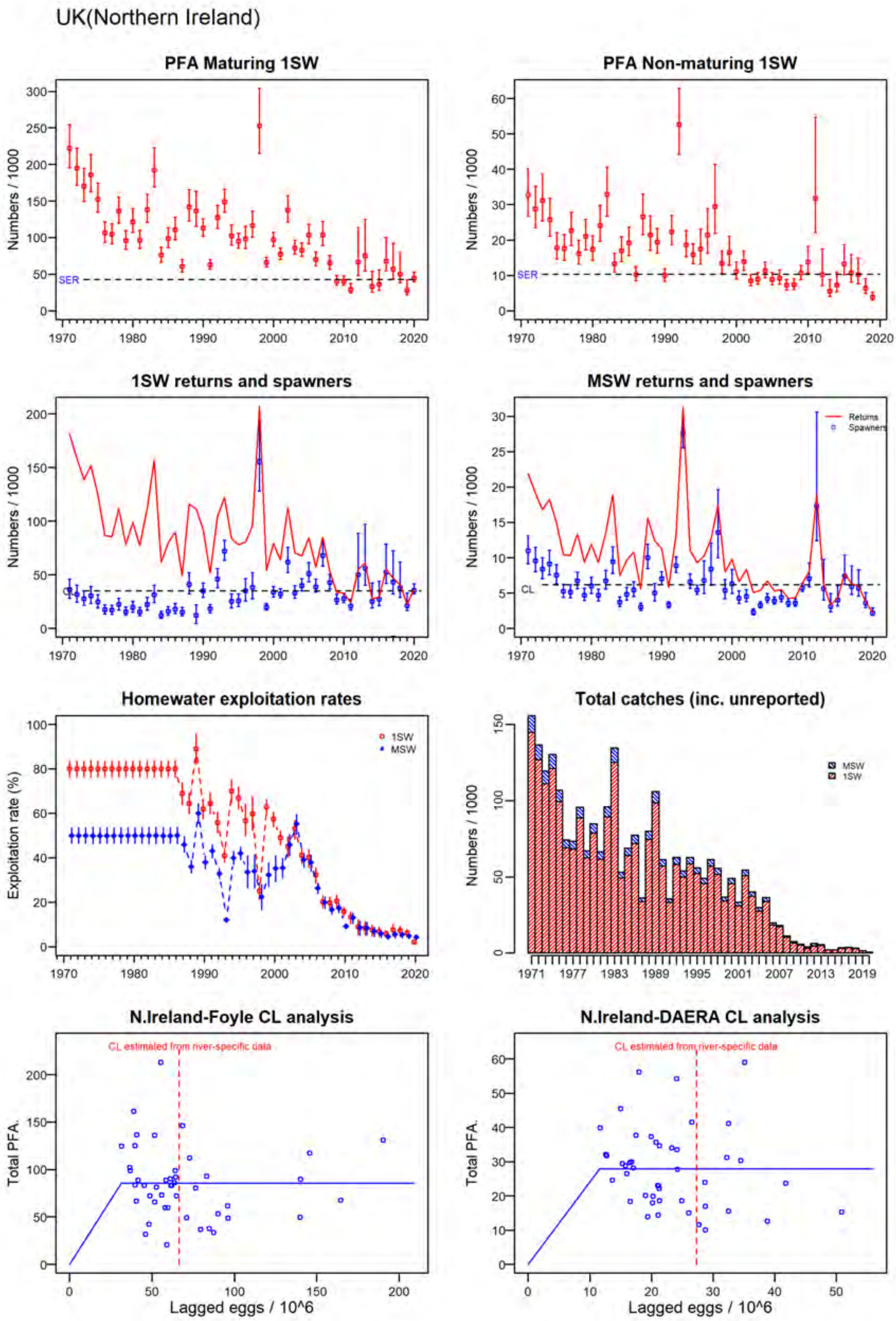


Figure 3.3.4.1i. Summary of fisheries and stock description, UK (Northern Ireland). The river-specific CLs, which are used for assessment purposes, are included on the regional CL analysis plots (for comparison, the CLs estimated from the regional S–R relationships are at the inflection points).

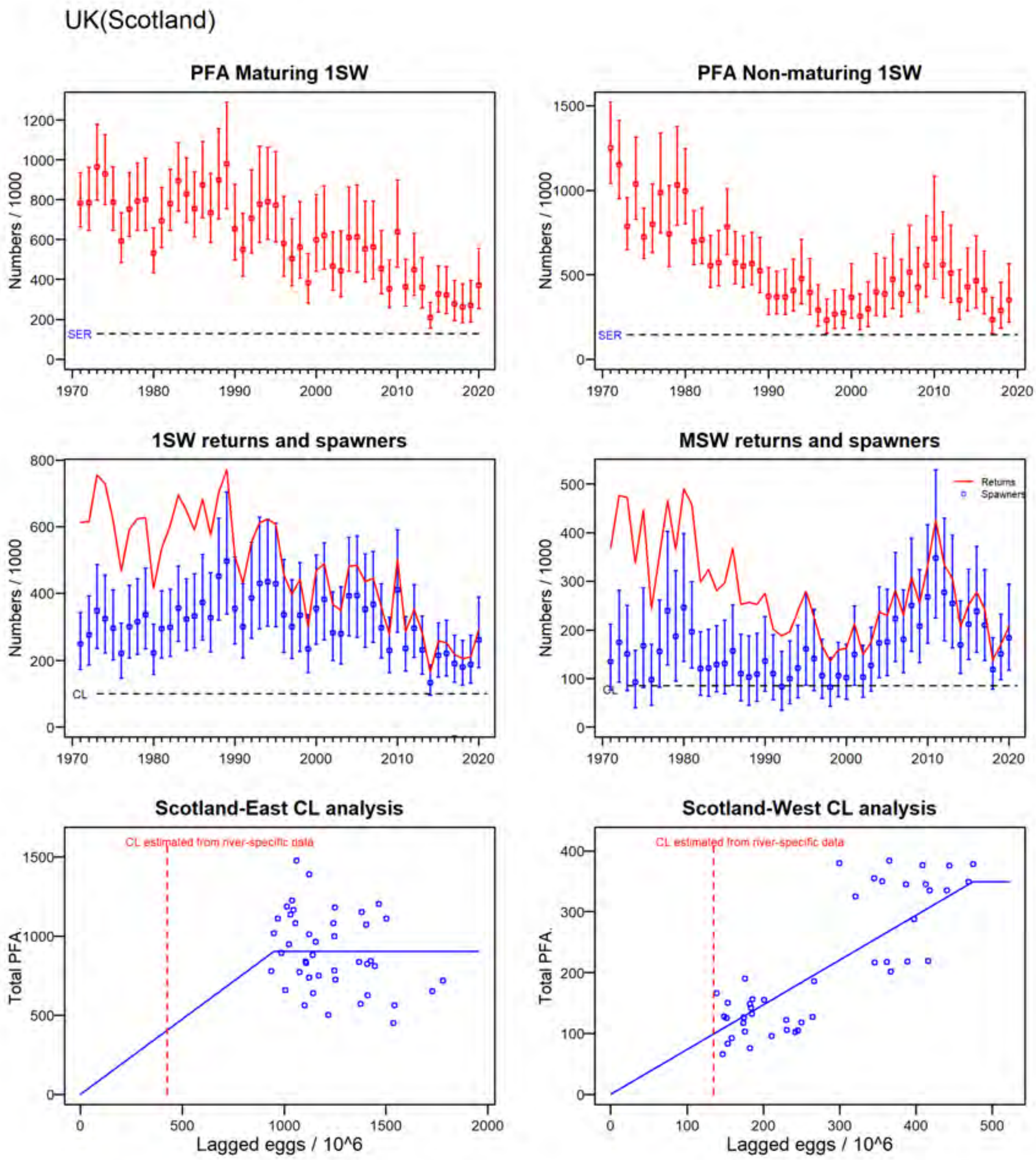


Figure 3.3.4.1j. Summary of fisheries and stock description, UK (Scotland). The river-specific CL, which is used for assessment purposes, is included on the national CL analysis plot (for comparison, the CL estimated from the national S–R relationship is at the inflection point). Note: UK (Scotland) catches and homewater exploitation not presented here due to unavailability for public release at the time of publication.

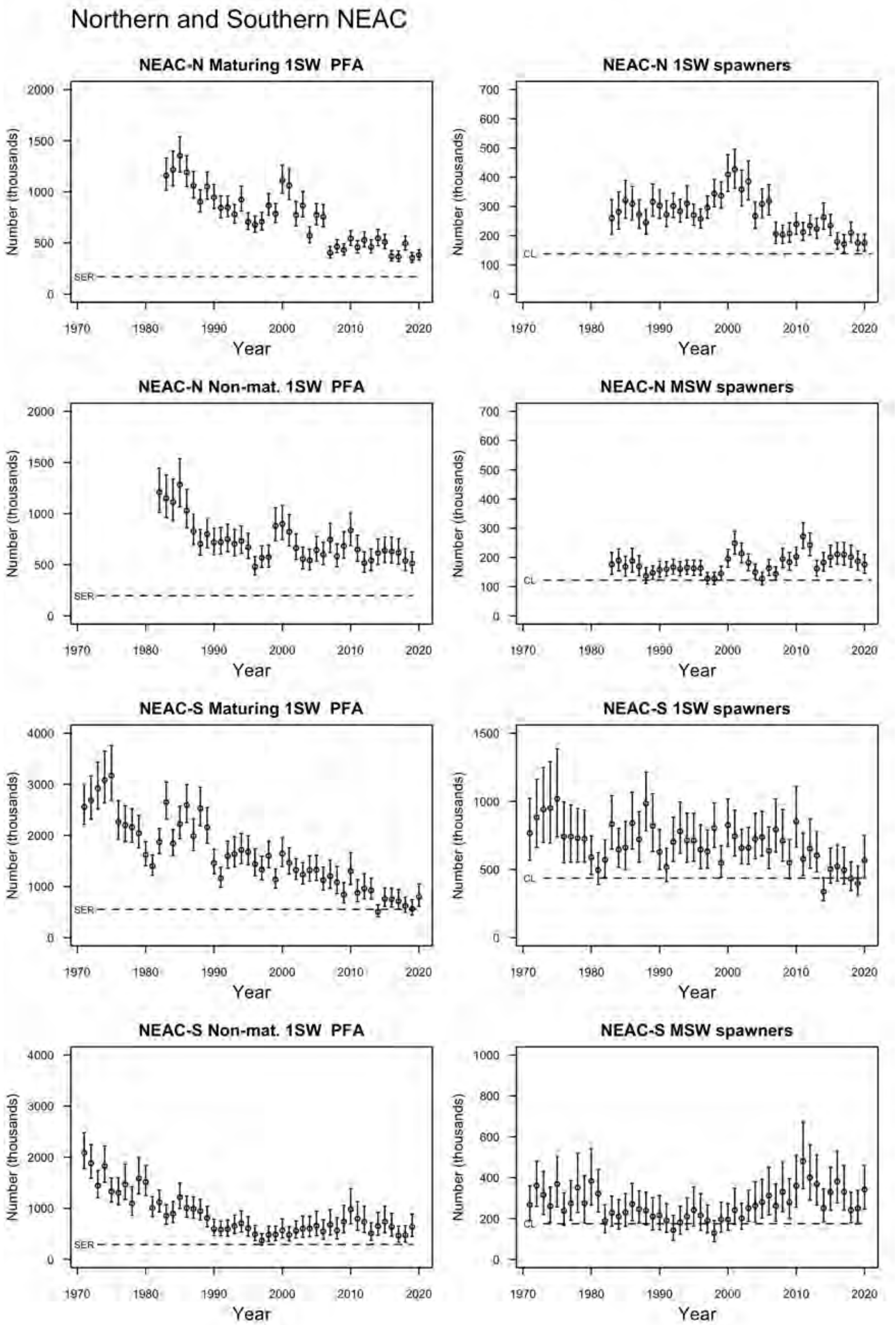


Figure 3.3.4.2. Estimated PFA (left panels) and spawning escapement (right panels) with 90% confidence limits, for maturing 1SW (1SW spawners) and non-maturing 1SW (MSW spawners) salmon in Northern (NEAC-N) and Southern (NEAC-S) NEAC stock complexes.

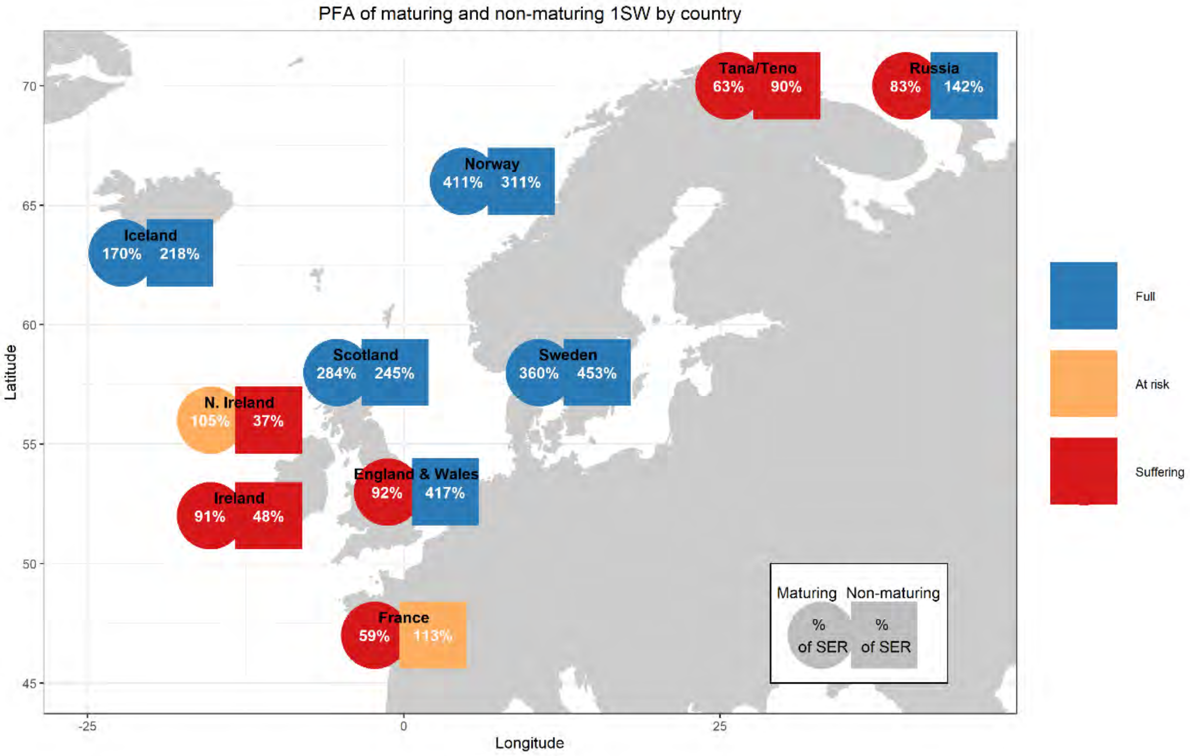


Figure 3.3.4.3. PFA of maturing (2020) and non-maturing (2019) in percent of spawner escapement reserve (% of SER). The percent of SER is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 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).

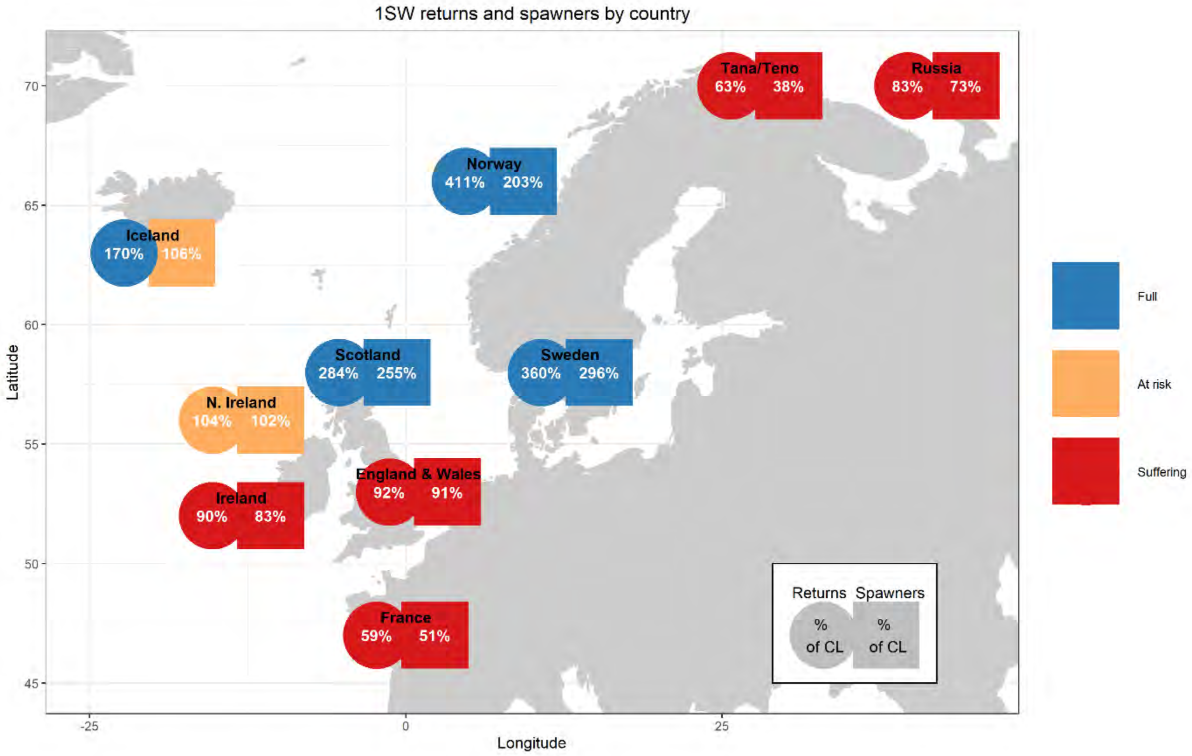


Figure 3.3.4.4. 1SW returns and spawners in percent of conservation limit (% of CL) for 2020. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the 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).

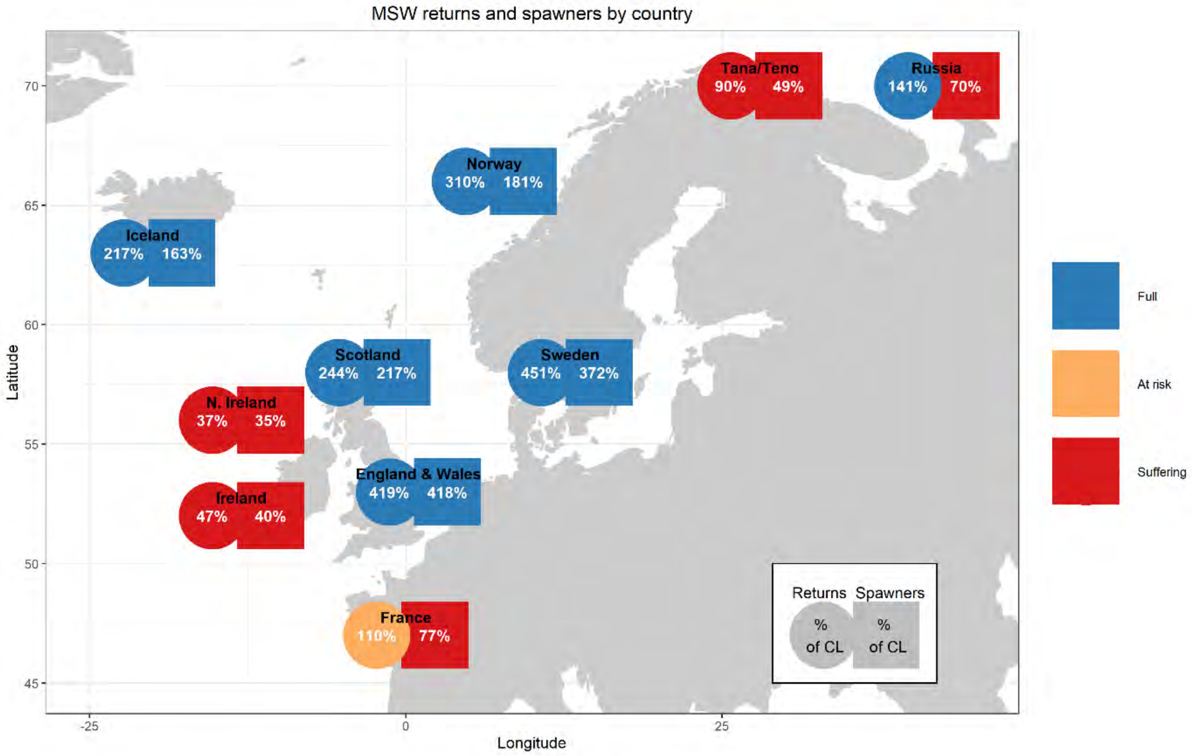


Figure 3.3.4.5. MSW returns and spawners in percent of conservation limit (% of CL) for 2020. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th percentile of the 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).

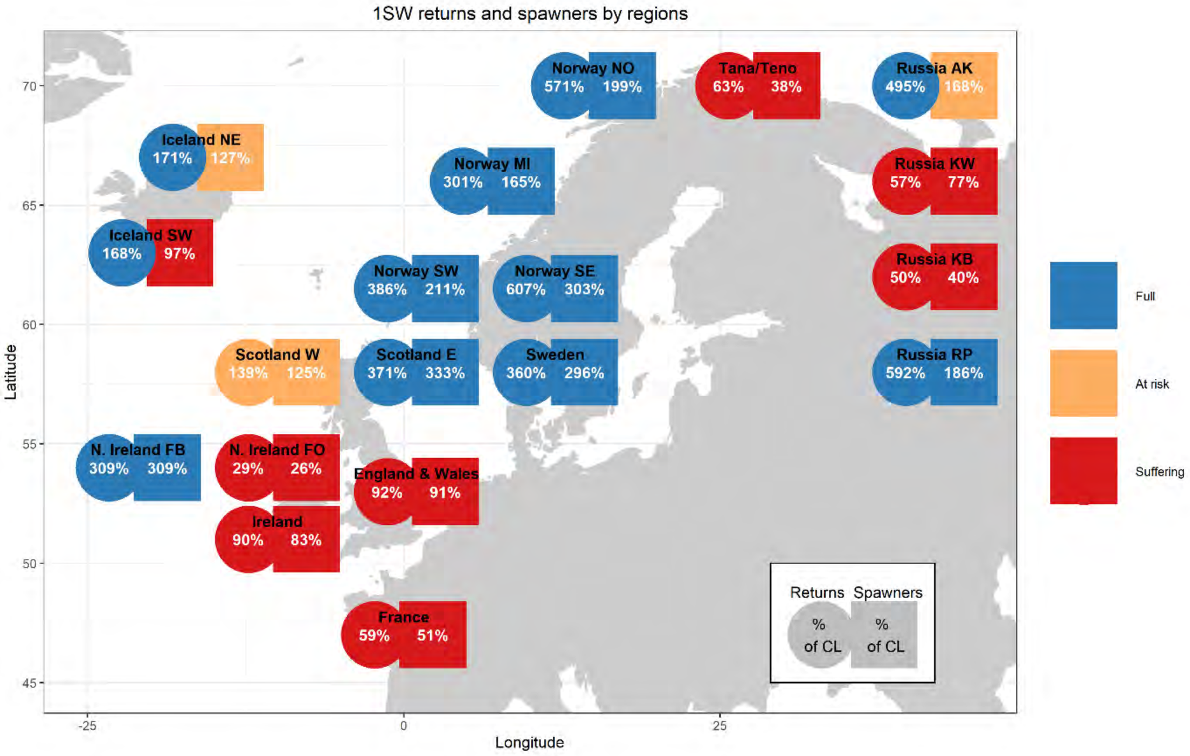


Figure 3.3.4.6. 1SW returns and spawners in percent of region-specific conservation limit (% of CL) for 2020. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th 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).

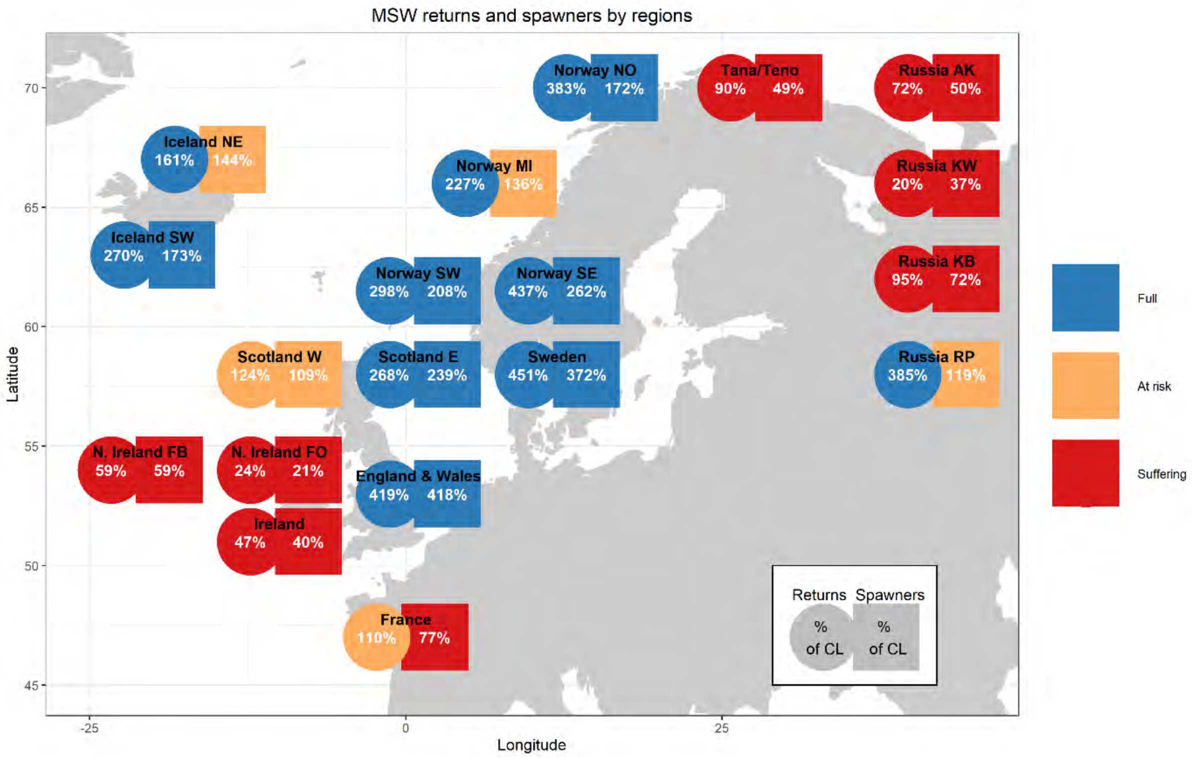


Figure 3.3.4.7. MSW returns and spawners in percent of region-specific conservation limit (% of CL) for 2020. The percent of CL is based on the median of the Monte Carlo distribution. The colour shading represents the three ICES stock status designations: Full (at full reproductive capacity: the 5th 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).

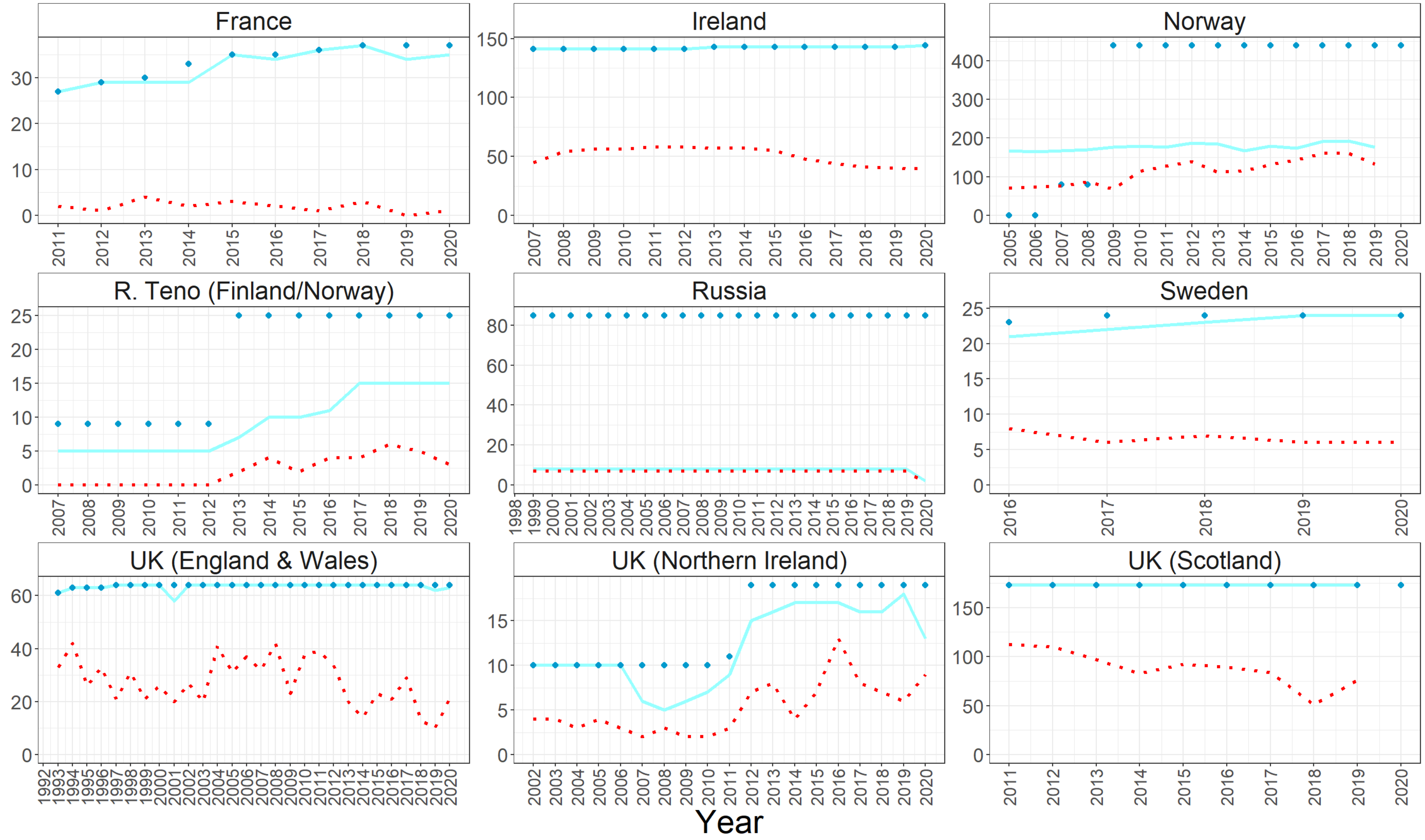


Figure 3.3.5.1 Time-series showing the number of rivers with established CLs (light blue dotted lines), the number of rivers assessed annually (light blue solid lines), and the number of rivers meeting CLs annually (red dotted lines) for jurisdictions in the NEAC area

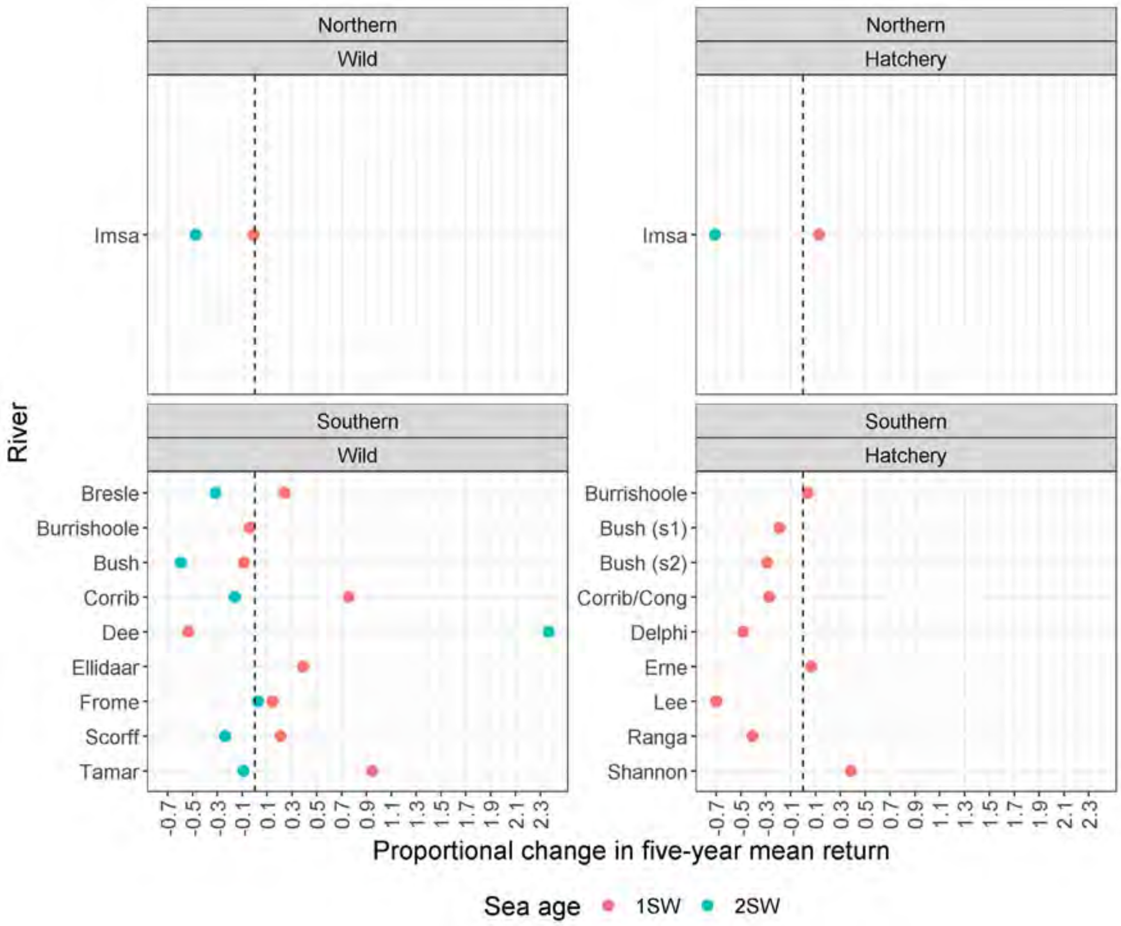


Figure 3.3.6.1. Comparison of the proportional change in the most recent five-year mean return rates compared to the previous five-year mean return rates for 1SW and 2SW wild (left hand panels) and hatchery (right hand panels) smolts to rivers of Northern (upper panels) and Southern NEAC (lower panels) areas. Populations with at least three datapoints 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.

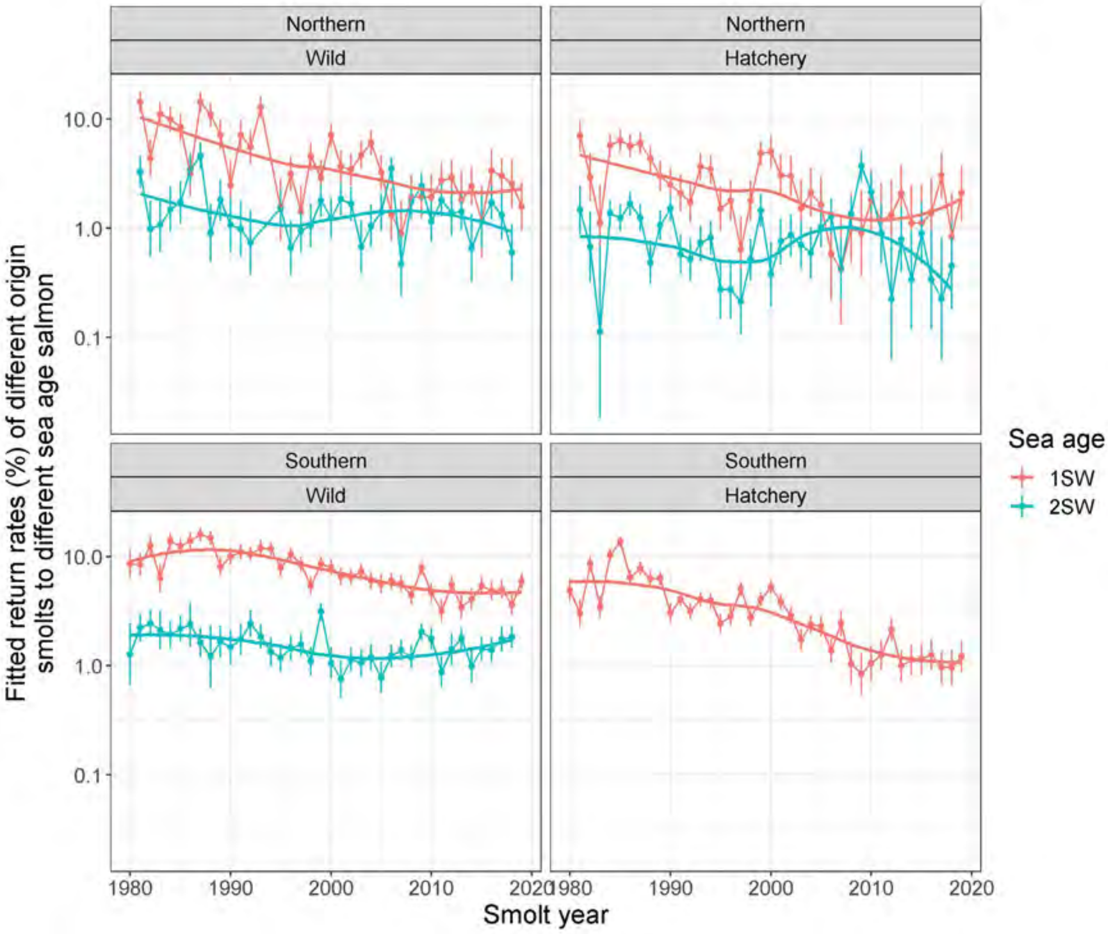


Figure 3.3.6.2. Least squared (marginal mean) average annual return rates (%) of wild (left hand panels) and hatchery origin smolts (right hand panels) of 1SW and 2SW salmon to Northern (top panels) and Southern NEAC areas (bottom panels). For most rivers in Southern NEAC, the values are returns to the coast prior to the homewater coastal fisheries. Mean annual return rates for each origin and area were estimated from a general linear model assuming quasi-Poisson errors (log-link function). Error bars represent standard errors. 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 return rates (%) for 1SW and 2SW returns by smolt year.

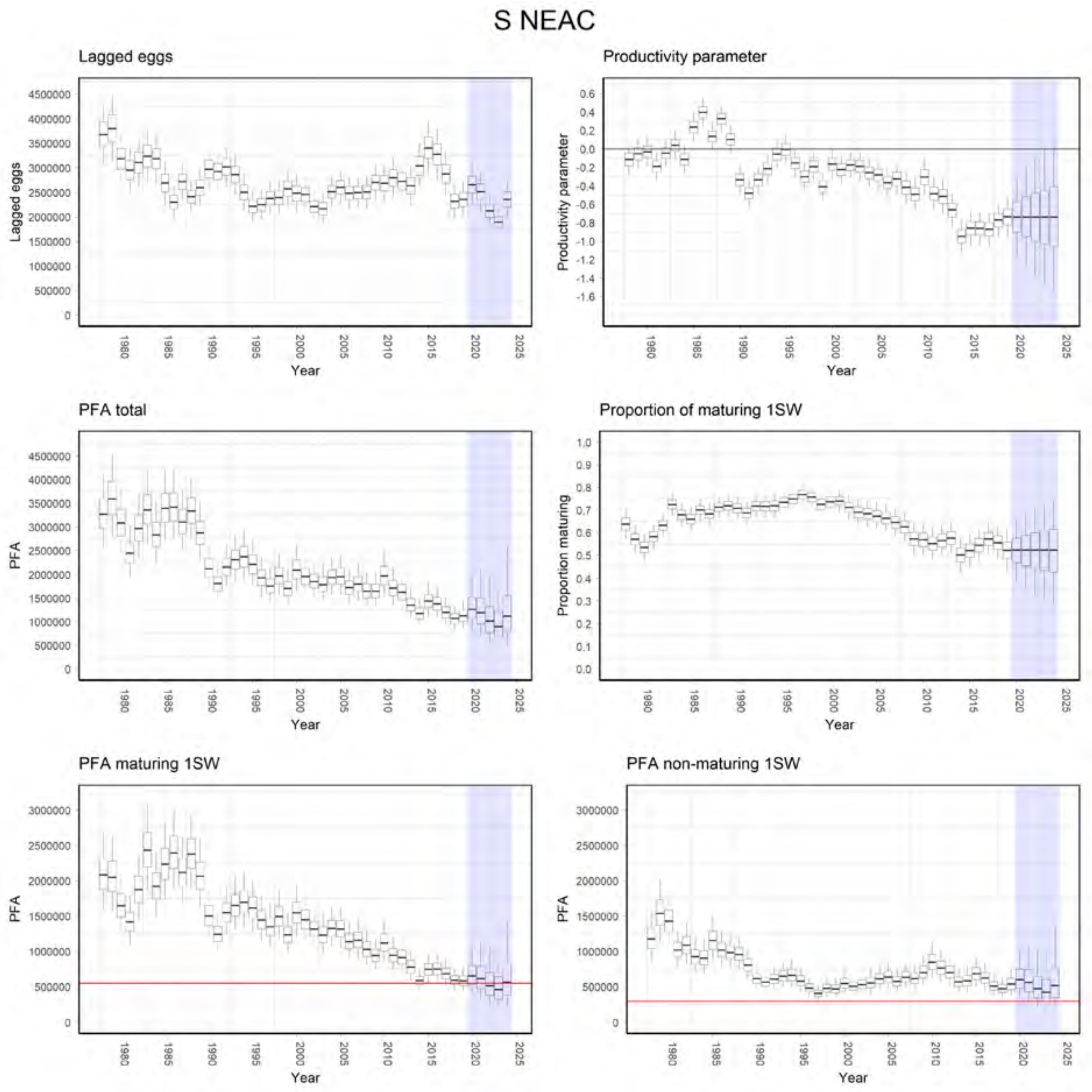


Figure 3.4.2.1. Southern NEAC: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

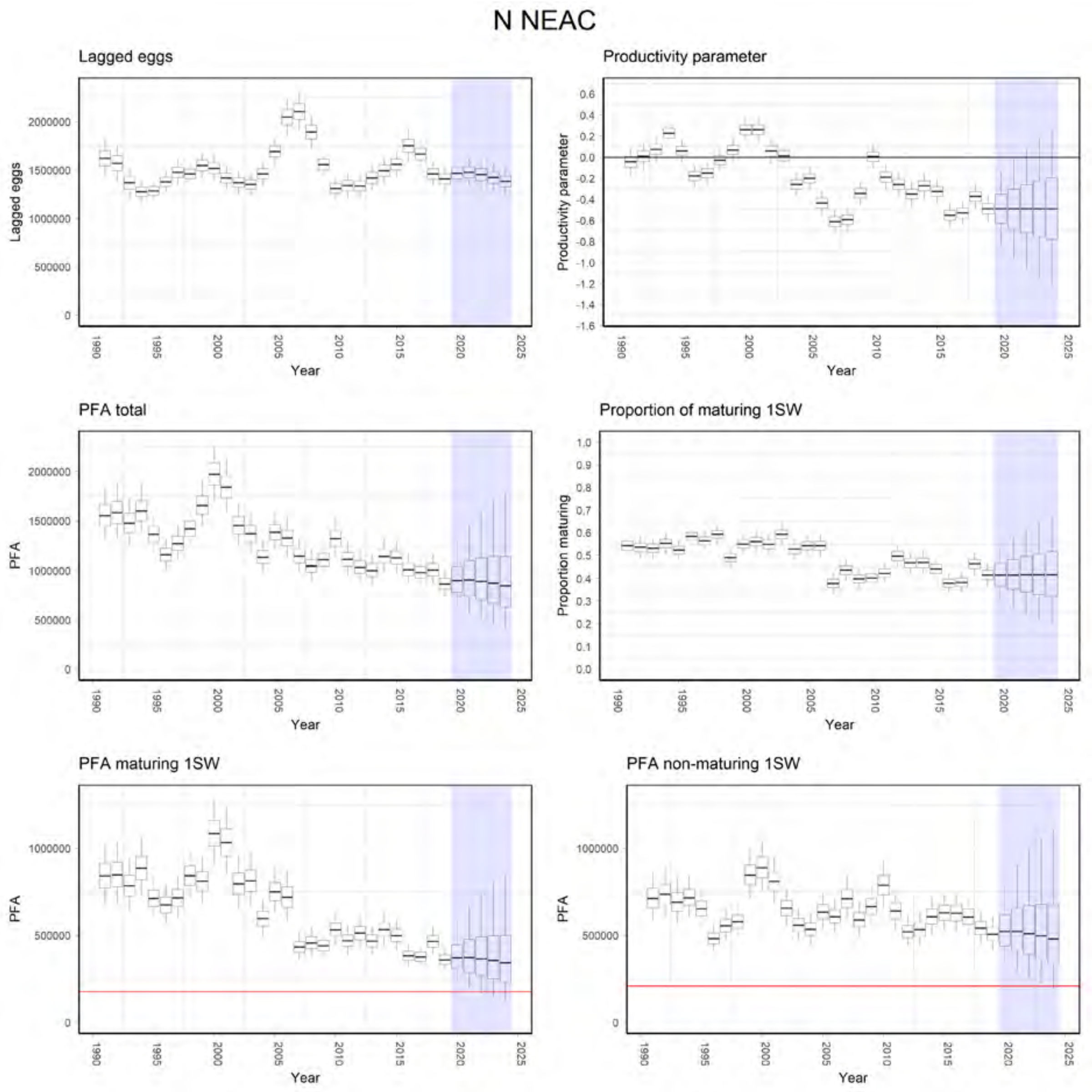


Figure 3.4.2.2. Northern NEAC: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

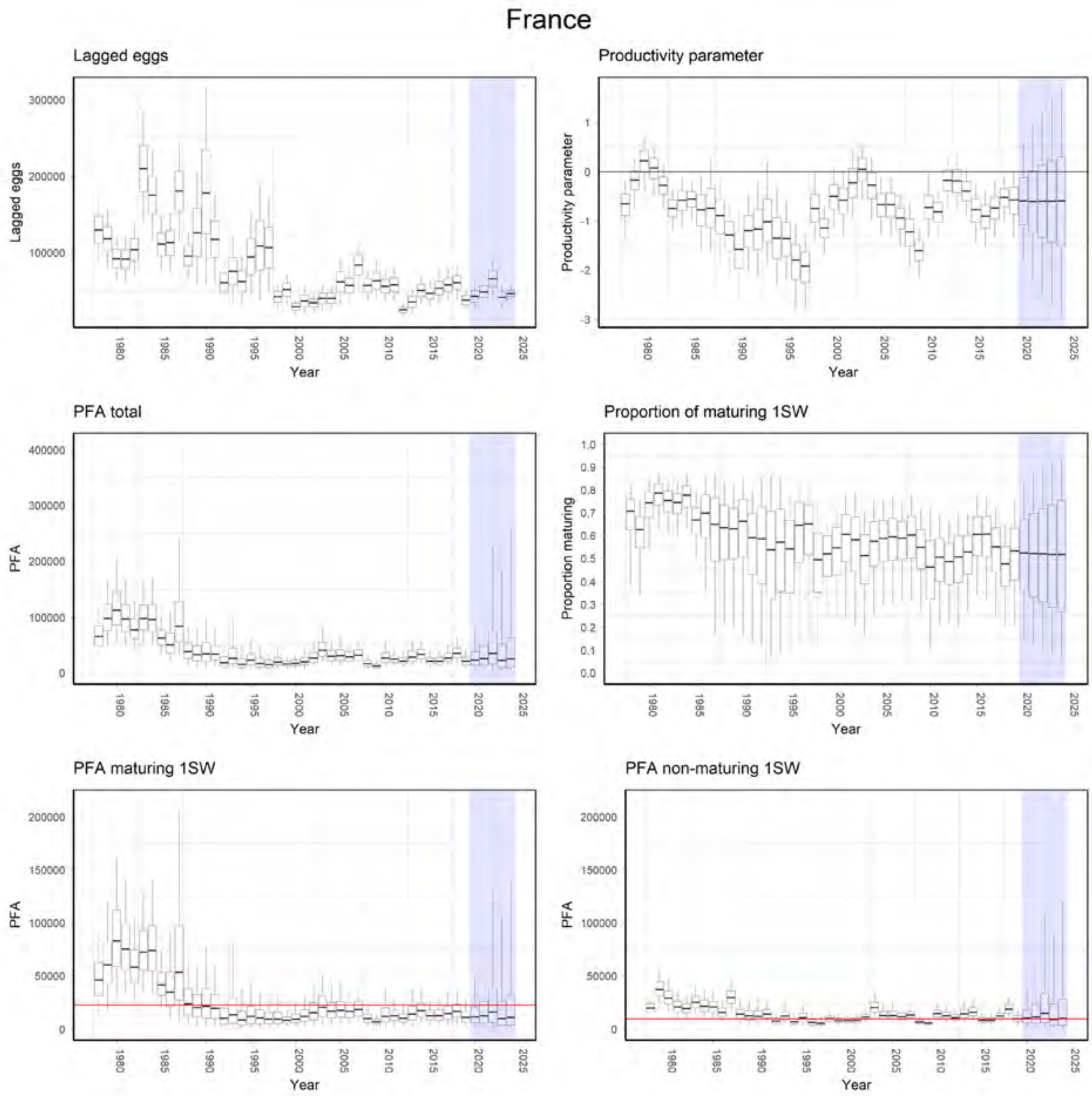


Figure 3.4.3.1. France: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

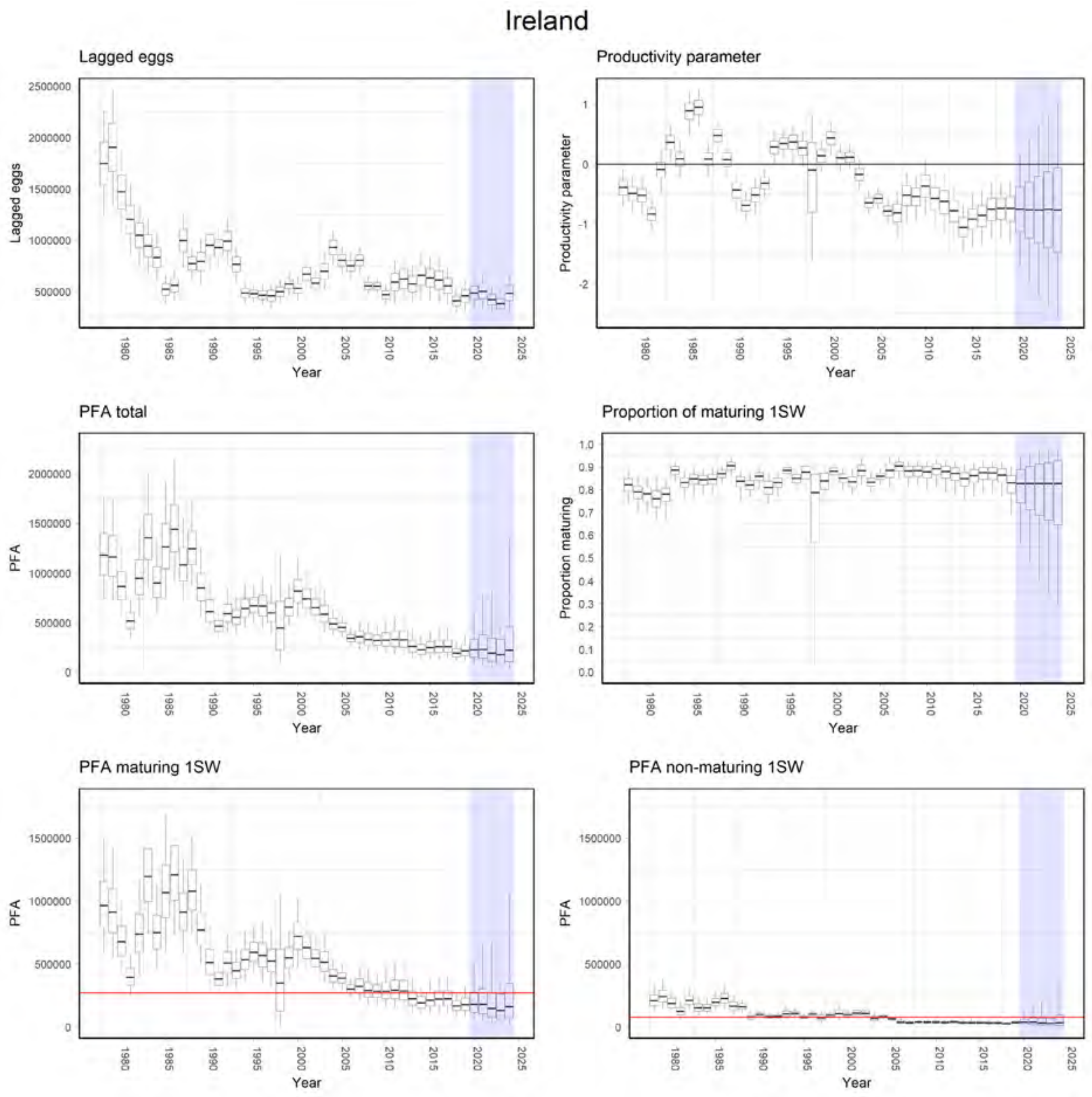


Figure 3.4.3.2. Ireland: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

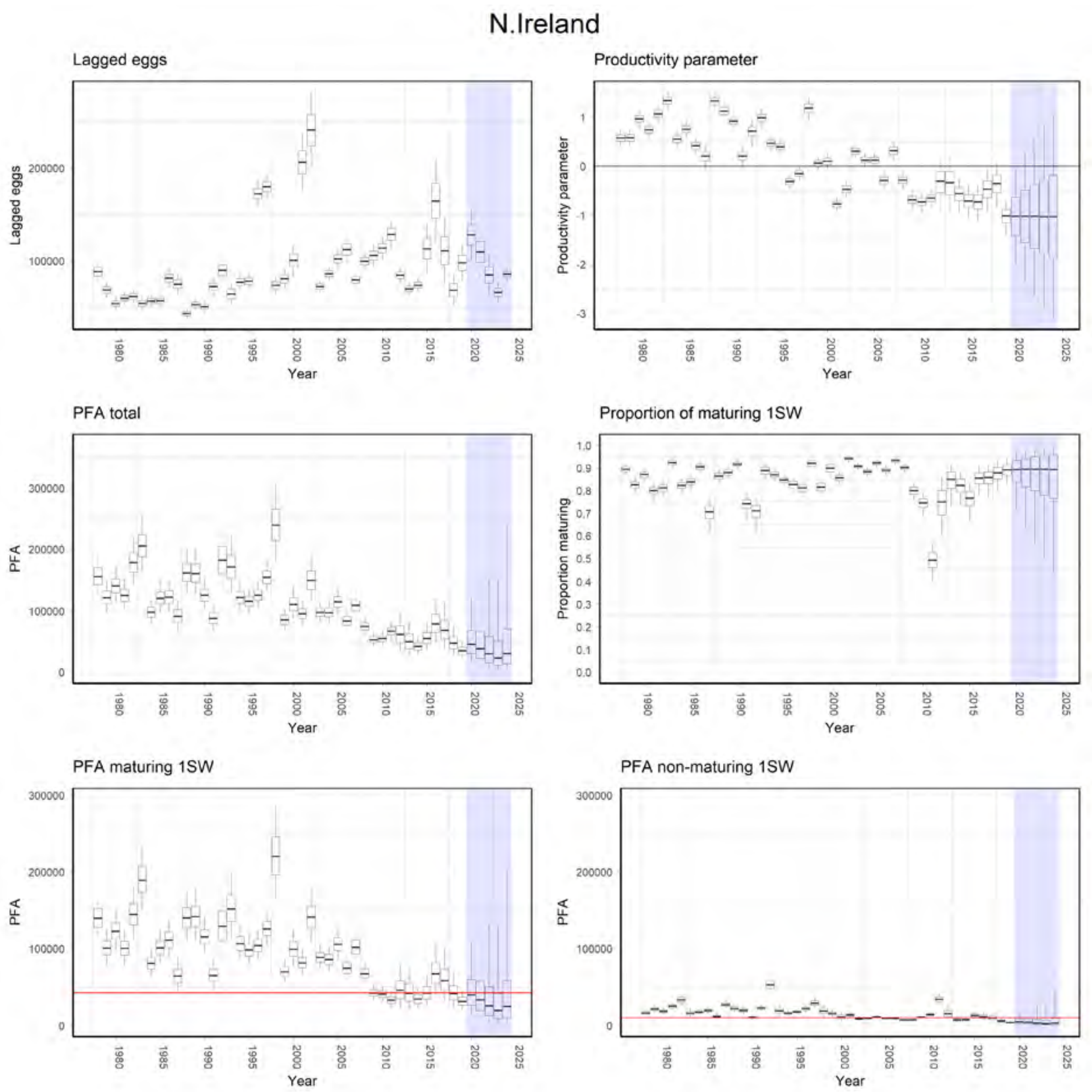


Figure 3.4.3.3. UK (Northern Ireland): Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

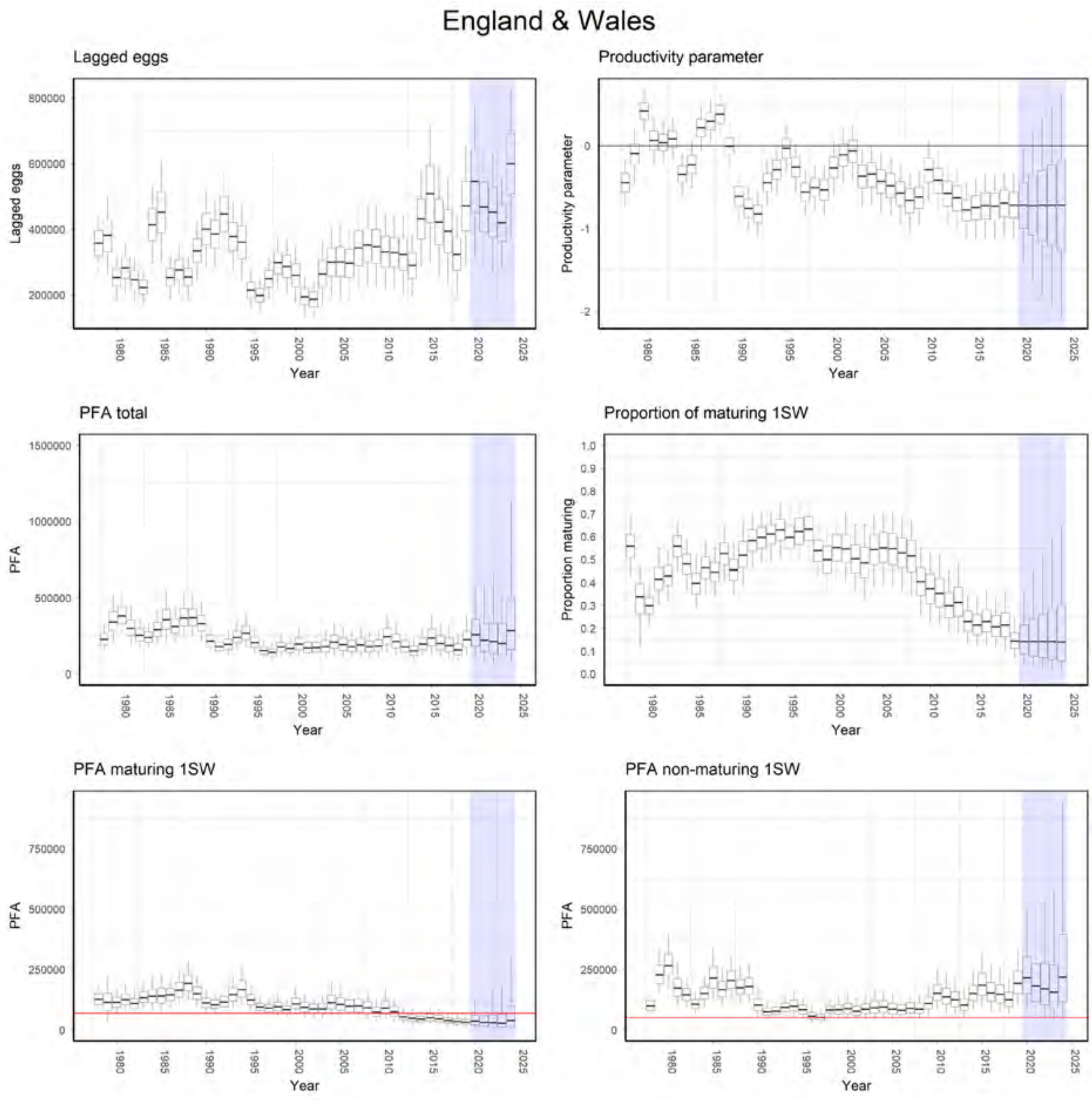


Figure 3.4.3.4. UK (England & Wales): Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

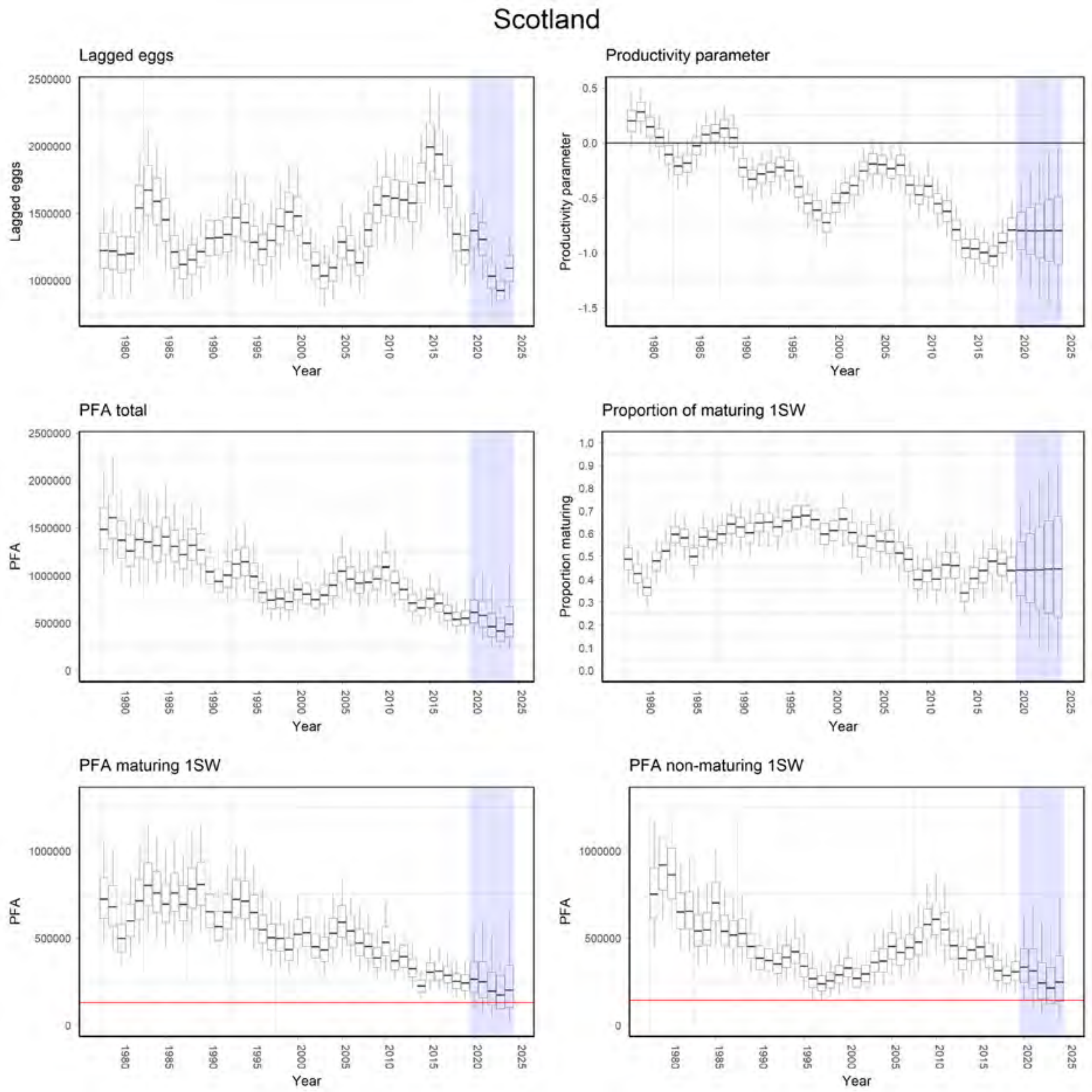


Figure 3.4.3.5 UK (Scotland): Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

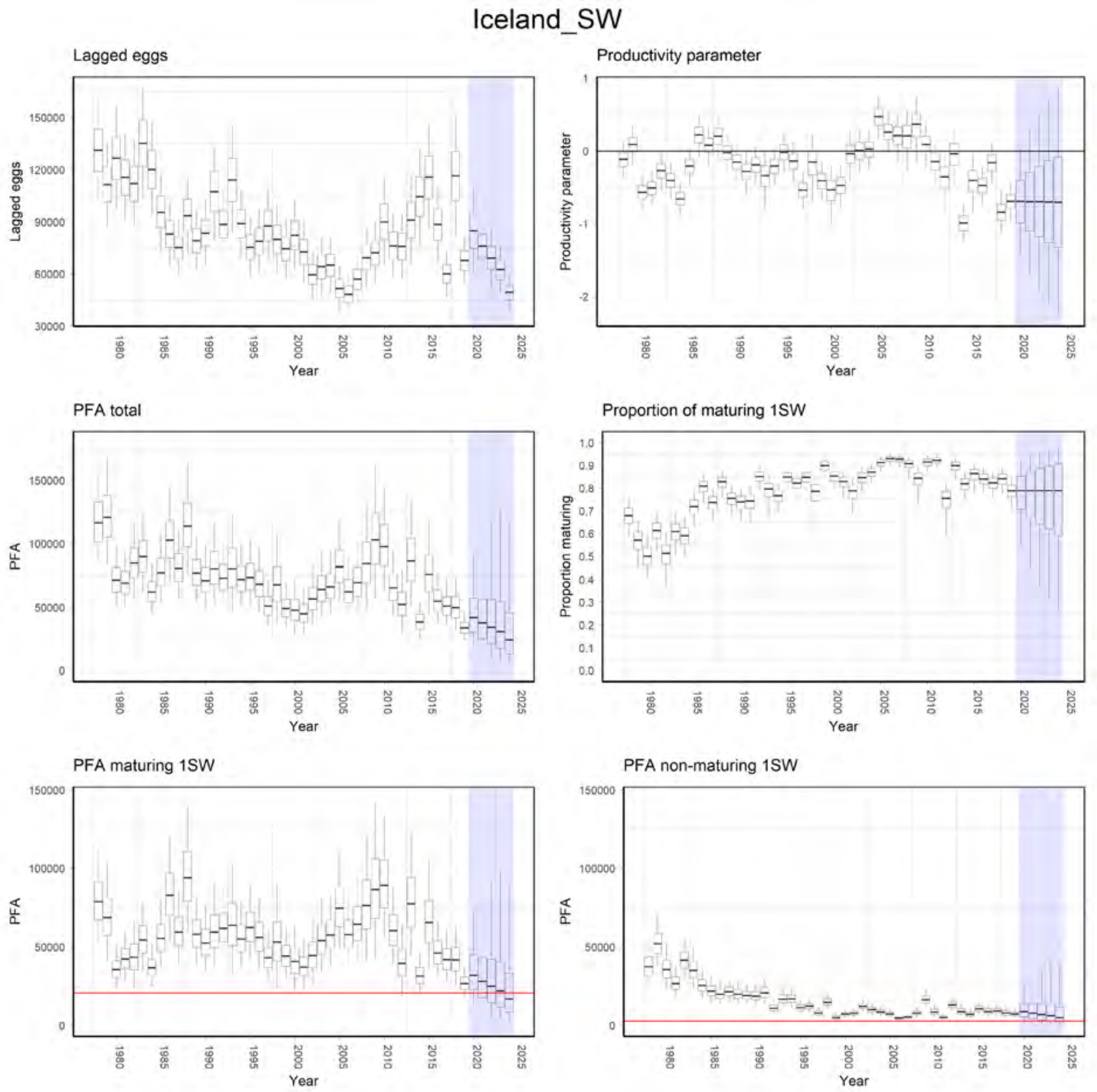


Figure 3.4.3.6. Iceland (south/west regions): Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

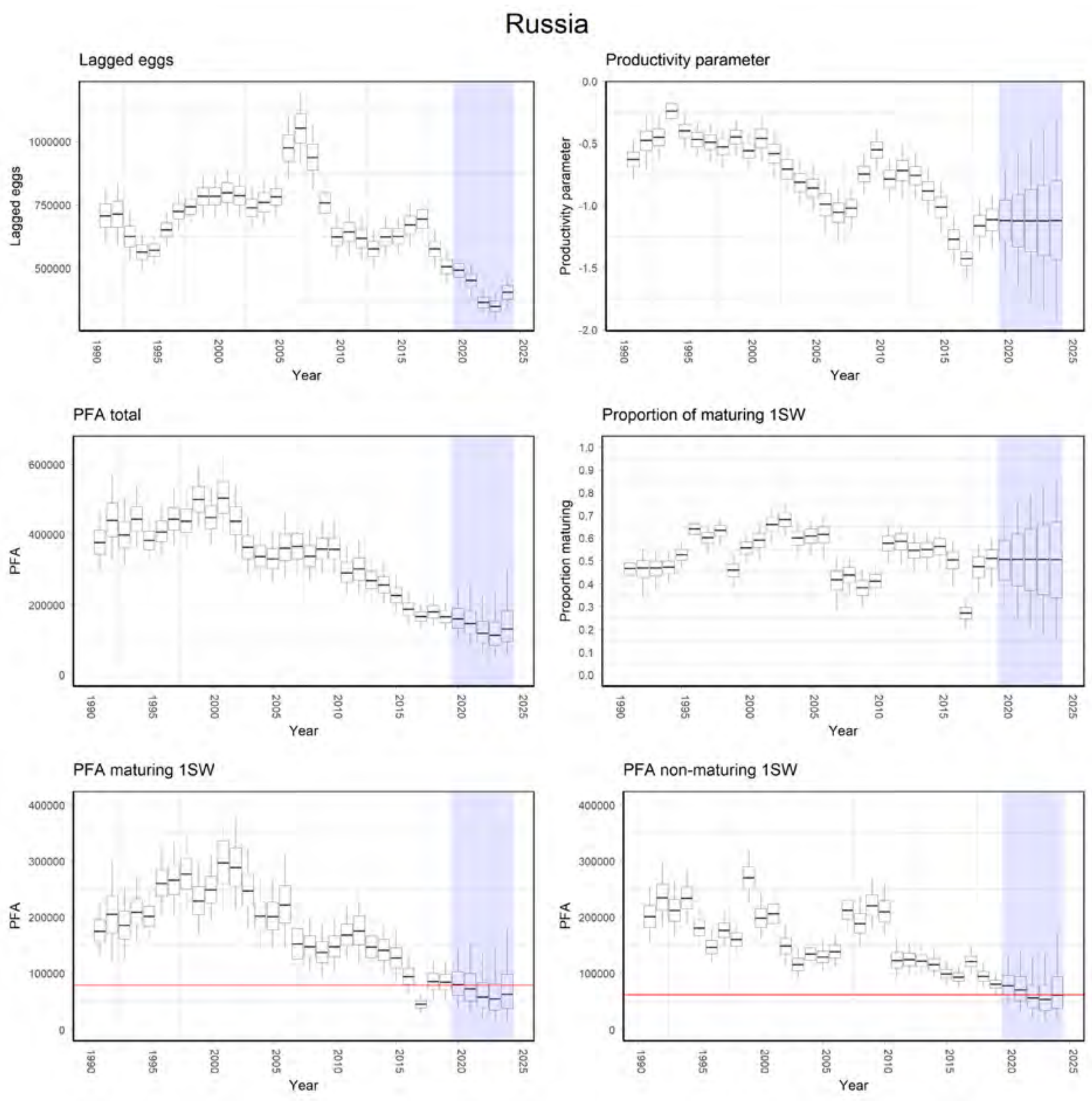


Figure 3.4.3.7. Russia: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

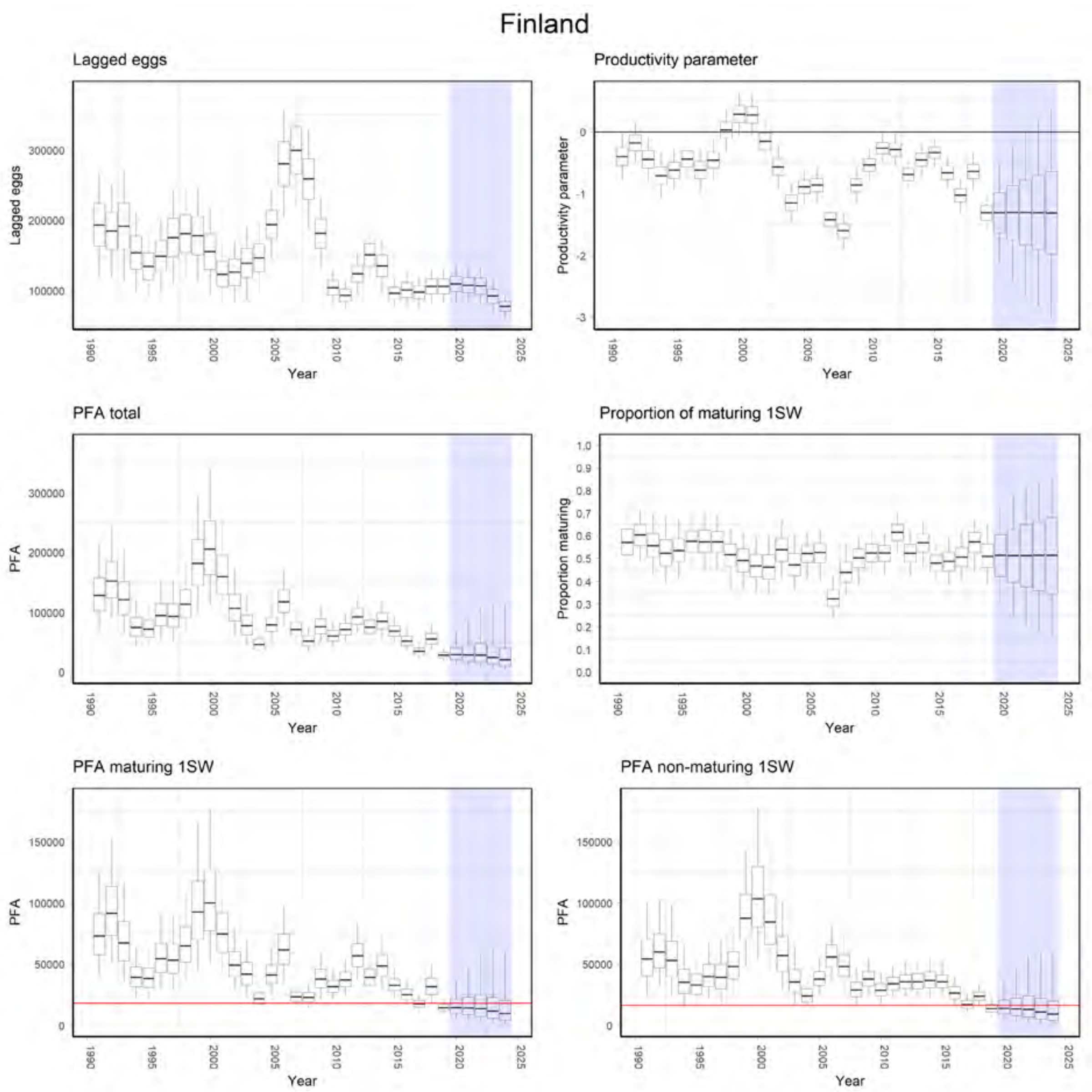


Figure 3.4.3.8. Finland: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

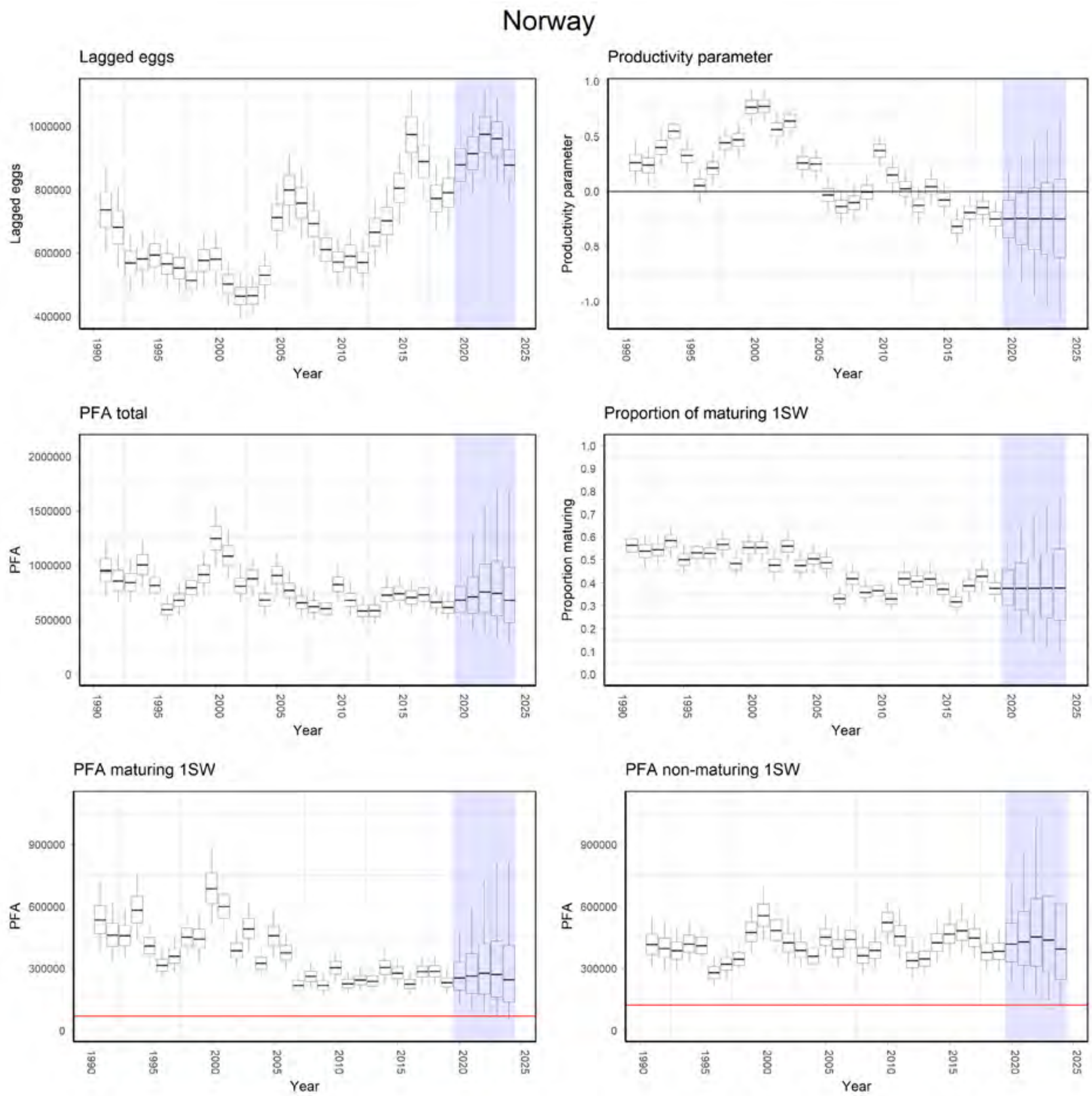


Figure 3.4.3.9. Norway: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

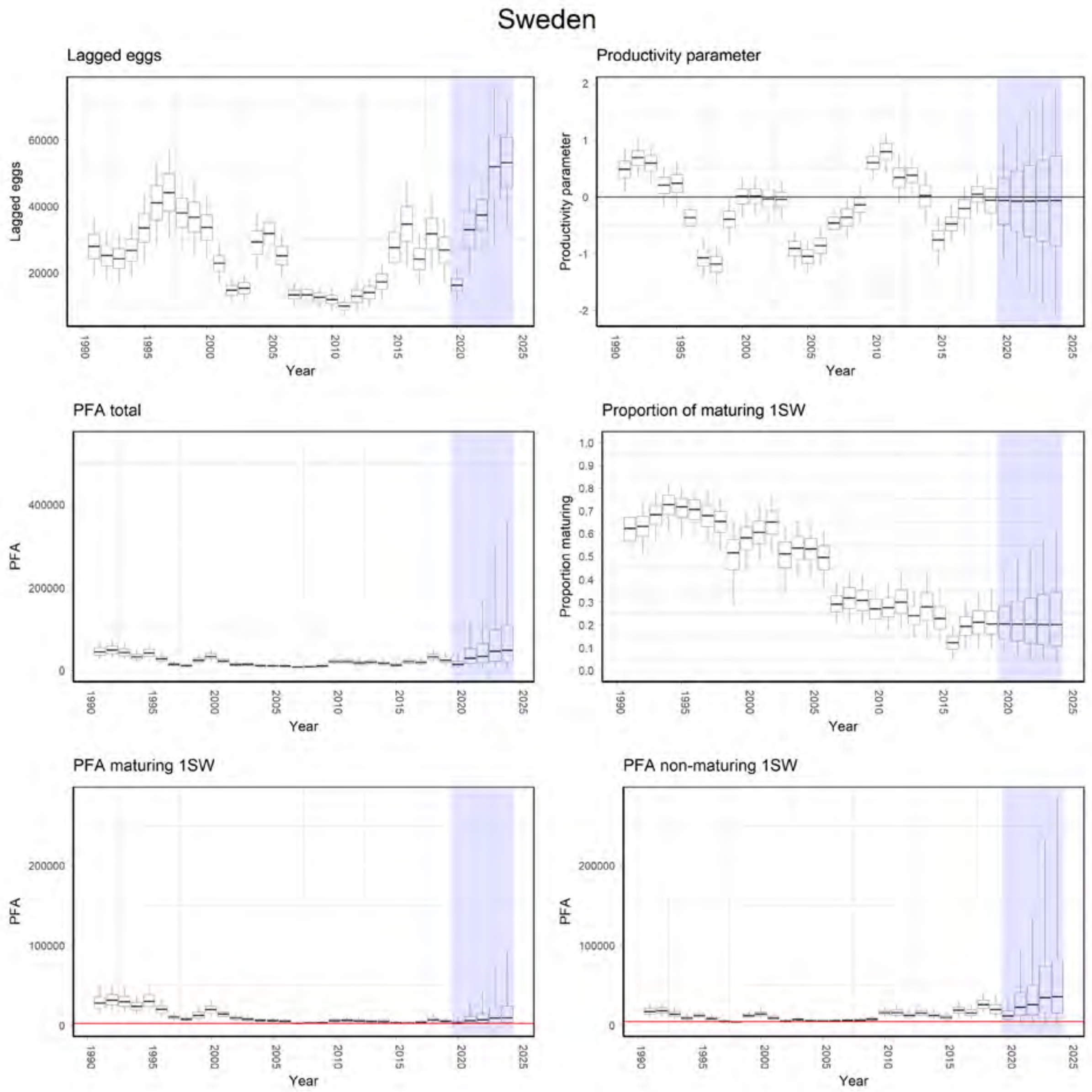


Figure 3.4.3.10. Sweden: Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

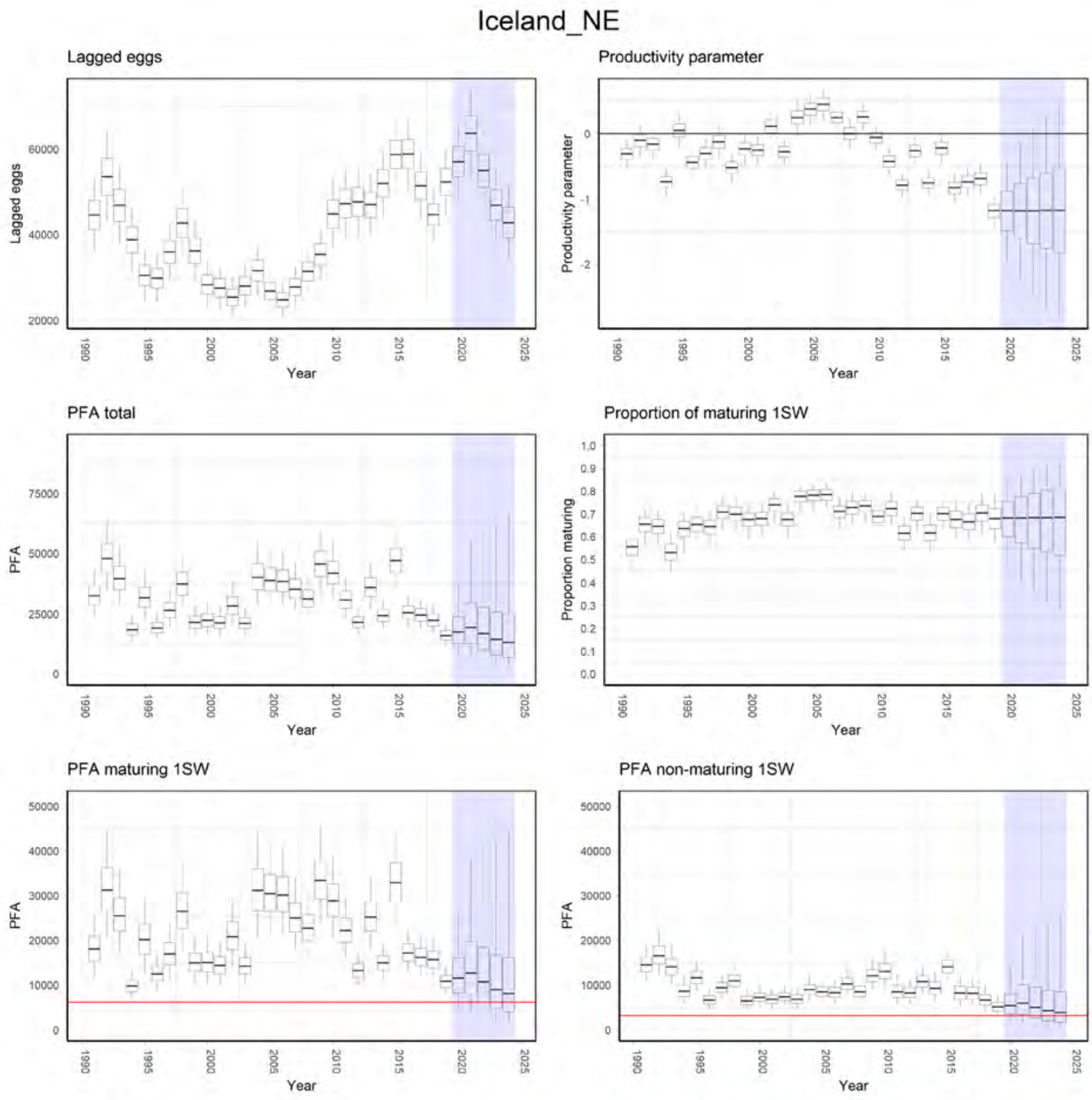
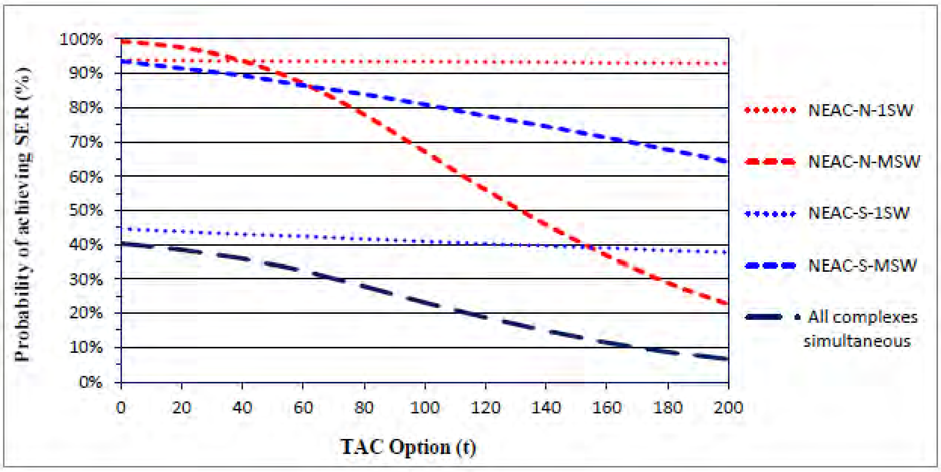
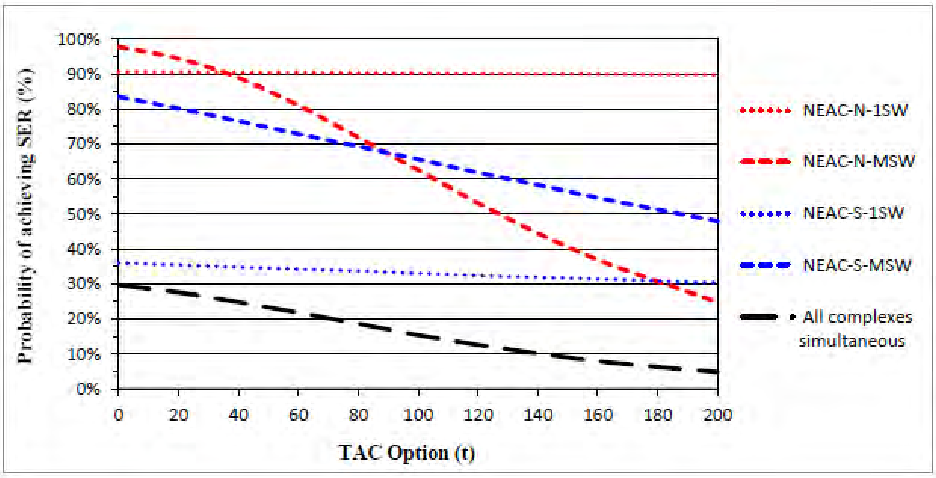


Figure 3.4.3.11. Iceland (north/east regions): Lagged eggs (in 1000s) from 1SW and MSW spawners combined, productivity parameter from eggs to PFA, total PFA, proportion 1SW maturing, and PFA of maturing and non-maturing stocks, for PFA years 1978 to 2024. For PFAs, proportion maturing and productivity parameter for the last five years (2020 to 2024) are forecasts (as indicated by the blue shaded region). The horizontal lines in the bottom panels are the age-specific SER values. Box and whiskers show the 5th, 25th, 50th, 75th and 95th Bayesian credible intervals (BCIs).

Catch options for 2021/22 season:



Catch options for 2022/23 season:



Catch options for 2023/24 season:

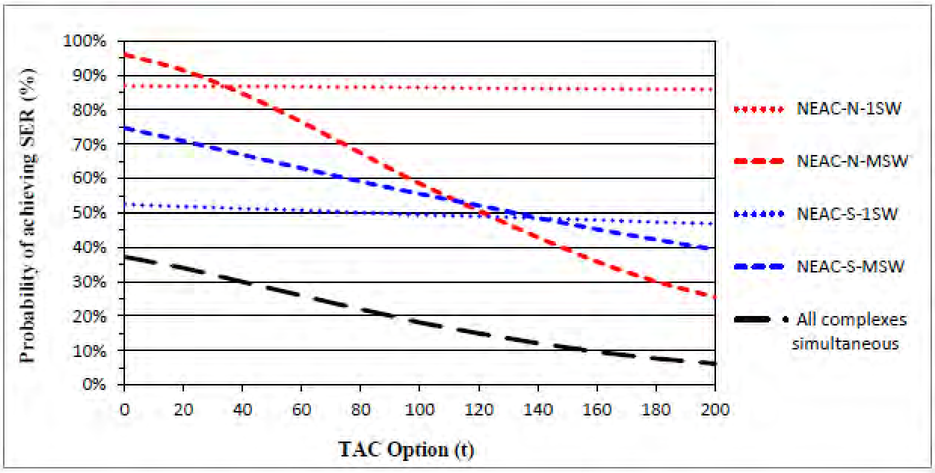


Figure 3.5.1.1 Probability of Northern and Southern NEAC - 1SW and MSW stock complexes, and all stock complexes simultaneously, achieving their SERs for different catch options for the Faroes fishery in the 2021/2022 to 2023/2024 fishing seasons.

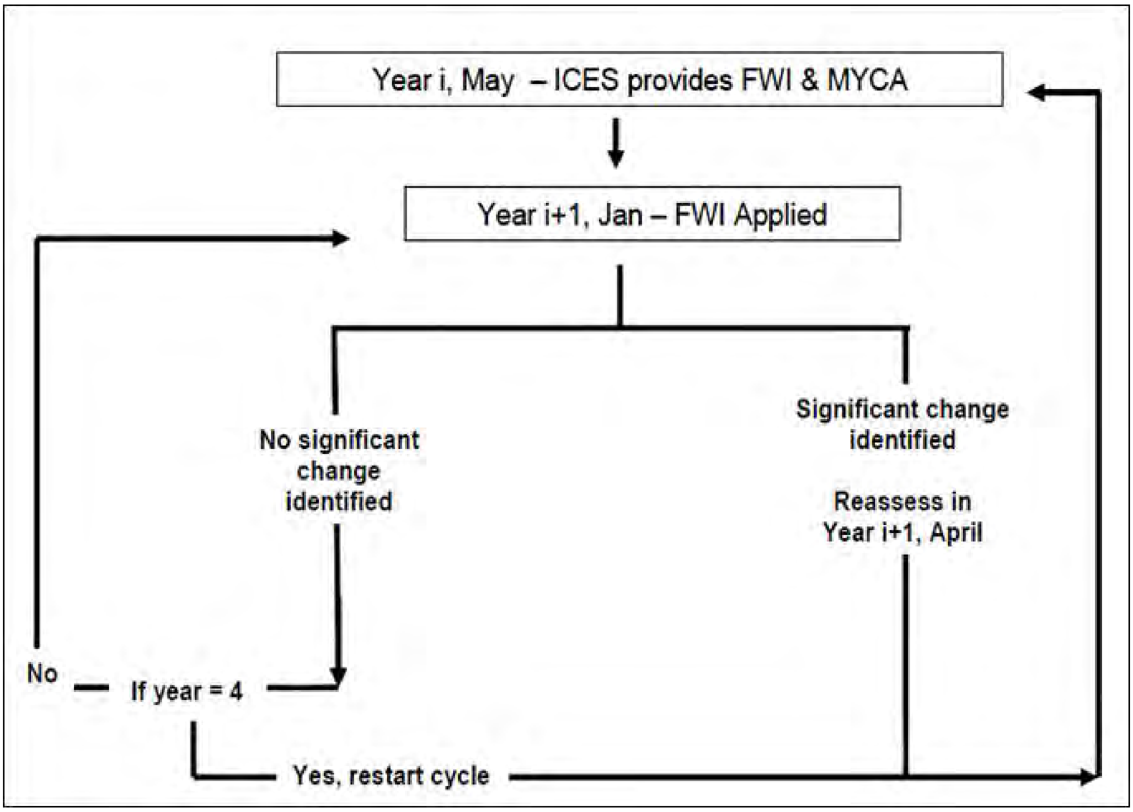


Figure 3.6.1.1. Suggested timeline for employment of the Framework of Indicators (FWI). In Year i, ICES provides multi-year catch advice (MYCA) and an updated FWI which re-evaluates the updated datasets and is summarised in an Excel worksheet. In January of Year i+1 the FWI is applied and two options are available depending on the results. If no significant change is detected, no reassessment is necessary and the cycle continues to Year i+2. If no significant change is detected in Year i+2, the cycle continues to Year i+3. If a significant change is detected in any year, then reassessment is recommended. In that case, ICES would provide an updated FWI the following May. ICES would also provide an updated FWI if year equals four.

FWI NEAC	2022	Indicators suggest:	REASSESS

Indicators for Northern NEAC 1SW PFA

		Insert data from 2021 here	N reg	Slope	Intercept	r^2	Median PFA in 2021	12.5%ile	87.5%ile	Reassess in year 2022? Outside 75% conf.lim. below	above	Outside 75% confidence limits below	above
1	Returns all 1SW NO PFA est		37	0.514780	-27673.84	0.92	371561	111272.56	215924.28	0	0	Uninformative	Uninformative
2	Survivals W 1SW NO Imsa		37	0.000011	-2.55	0.47	371561	-2.48	5.45	0	0	Uninformative	Uninformative
3	Survivals H 1SW NO Imsa		38	0.000005	-0.43	0.31	371561	-1.17	4.31	0	0	Uninformative	Uninformative
4	Counts all Akujoki (1SW)		18	0.000151	-16.38	0.38	371561	2.77	76.58	0	0	Uninformative	Uninformative
5	Counts all NO Nausta (1SW)		23	0.001608	302.93	0.22	371561	49.48	1751.08	0	0	Uninformative	Uninformative
6	Catch rT&N 1SW FI		22	0.0168897	-672.3621	0.51	371561	-2565.78	13772.15	0	0	Uninformative	Uninformative
								Sum of scores		0	0	Indicators suggest that the PFA forecast is an overestimation.	Indicators suggest that the PFA forecast is an underestimation. REASSESS

Indicators for Northern NEAC MSW PFA

		Insert data from 2021 here	N reg	Slope	Intercept	r^2	Median PFA in 2021	12.5%ile	87.5%ile	Reassess in year 2022? Outside 75% conf.lim. below	above	Outside 75% conf.lim. below	above
1	PFA-MSW-CoastNorway		37	0.328645	17743.77	0.79	521052	148154.03	229815.63	0	0	Uninformative	Uninformative
2	Orkla counts		17	0.013480	-3420.75	0.55	521052	1593.48	5612.91	0	0	Uninformative	Uninformative
3	Counts all NO Nausta		23	0.003829	-1199.20	0.33	521052	5.92	1585.55	0	0	Uninformative	Uninformative
4	Returns all 2SW NO PFA est		27	0.2051312	37948.148	0.31	521052	69947.74	219716.58	0	0	Uninformative	Uninformative
5	Catch W rT&N 2SW FI		22	0.0080952	-2358.398	0.36	521052	-571.96	4291.25	0	0	Uninformative	Uninformative
								Sum of scores		0	0	Indicators suggest that the PFA forecast is an overestimation.	Indicators suggest that the PFA forecast is an underestimation. REASSESS

Indicators for Southern NEAC 1SW PFA

		Insert data from 2021 here	N reg	Slope	Intercept	r^2	Median PFA in 2021	12.5%ile	87.5%ile	Reassess in year 2022? Outside 75% conf.lim. below	above	Outside 75% conf.lim. below	above
1	Ret. 1SW UK(E&W) Tamar M		27	0.001914	1101.95	0.31	616416	998.67	3564.69	0	0	Uninformative	Uninformative
2	Ret. W 1SW UK(E&W) Frome M		48	0.000534	-78.84	0.43	616416	-251.66	752.60	0	0	Uninformative	Uninformative
3	Ret. W 1SW UK(Sc.) North Esk M		40	0.006883	2807.30	0.68	616416	3877.19	10223.23	0	0	Uninformative	Uninformative
4	Surv. W 1SW UK(NI) Bush M		32	1.945E-05	-9.699526	0.64	616416	-6.22	10.80	0	0	Uninformative	Uninformative
5	Ret. Freshw 1SW UK(NI) Bush		46	0.000649	433.07	0.29	616416	73.98	1592.24	0	0	Uninformative	Uninformative
6	Ret. W 1SW UK(E&W) Dee M		29	0.0036297	-1008.336	0.58	616416	-193.60	2651.74	0	0	Uninformative	Uninformative
7	Count 1SW UK(E&W) Fowey M		26	0.0004136	171.28444	0.30	616416	155	698	0	0	Uninformative	Uninformative
8	Surv. 1SW UK(E&W) Frome		17	4.424E-06	0.2044226	0.32	616416	1	5	0	0	Uninformative	Uninformative
9	Surv coast 1SW UK(E&W) Dee M		24	2.984E-06	-0.319153	0.35	616416	-0.33	3.37	0	0	Uninformative	Uninformative
								Sum of scores		0	0	Indicators suggest that the PFA forecast is an overestimation.	Indicators suggest that the PFA forecast is an underestimation. REASSESS

Indicators for Southern NEAC MSW PFA

		Insert data from 2021 here	N reg	Slope	Intercept	r^2	Median PFA in 2021	12.5%ile	87.5%ile	Reassess in year 2022? Outside 75% conf.lim. below	above	Outside 75% conf.lim. below	above	
1	Ret. W 2SW UK(Sc.) Baddoch NM		33	0.000060	-12.15	0.37	565441	7.76	36.00	0	0	Uninformative	Uninformative	
2	Ret. W 2SW UK(Sc.) Girnoch NM		49	0.000049	2.19	0.40	565441	0.39	59.17	0	0	Uninformative	Uninformative	
3	Ret. W MSW UK(E&W) Itchen NM		33	0.000307	-63.78	0.26	565441	16.49	202.63	0	0	Uninformative	Uninformative	
4	Ret. W 1SW UK(E&W) Itchen NM		32	0.001016	-289.72	0.41	565441	83.41	485.80	0	0	Uninformative	Uninformative	NB use 2020 data
5	Ret. W MSW UK(E&W) Frome NM		48	0.000847	74.39	0.31	565441	-12.74	1119.57	0	0	Uninformative	Uninformative	
6	Ret. W 1SW UK(E&W) Frome NM		47	0.000741	154.34	0.22	565441	-6.85	1154.04	0	0	Uninformative	Uninformative	NB use 2020 data
7	Catch W MSW Ice Ellidaar NM		49	0.000120	-33.32	0.53	565441	-21.11	90.63	0	0	Uninformative	Uninformative	
8	Ret W 1SW UK(Sc.) North Esk NM		39	0.011622	4214	0.25	565441	5949	15622	0	0	Uninformative	Uninformative	NB use 2020 data
9	Ret. W 2SW UK(Sc.) North Esk NM		40	0.0089909	948.40233	0.53	565441	3598.83	8465.63	0	0	Uninformative	Uninformative	
								Sum of scores		0	0	Indicators suggest that the PFA forecast is an overestimation.	Indicators suggest that the PFA forecast is an underestimation. REASSESS	

Figure 3.6.2.1. Framework of indicators (FWI) spreadsheet for the Faroes fishery. The Northern NEAC stock complexes are shaded out since only the two Southern NEAC stock complexes are currently determining the outcome of the FWI. The Northern NEAC stock complexes are still retained in the spreadsheet because they may influence the advice in future.

4 North American Commission

4.1 NASCO has requested ICES to describe the key events of the 2020 fisheries

4.1.1 Key events of the 2020 fisheries

There were no significant changes in the 2020 fisheries.

The COVID-19 pandemic variably affected salmon fisheries in NAC in 2020. These impacts are summarised in Section 2.3.1. Reductions in licence sales from non-resident anglers in Québec and Maritimes was down in 2020.

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 a high 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 2020: Indigenous, Labrador resident subsistence, and recreational fishers. There were no commercial salmon fisheries in Canada in 2020 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 2020, 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 2020, 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 2020 for biological characteristics and tissue samples to identify the origin of harvested salmon.

The following management measures were in effect in 2020:

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 in 2020. 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 2020. 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 2020, a licensed gillnet subsistence trout and charr fishery for Labrador residents took place in estuary and coastal areas of Labrador. A total of 275 licences were issued in 2020. 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 2020 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 34 rivers. Large salmon could be retained throughout the season on eight rivers and for part of the season on twelve other rivers, for a total of 20 rivers. Small salmon could be retained for the entire season on 52 rivers and eight 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 and for the Island of Newfoundland (SFAs 3 to 14A, 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 2020 prompted angling restrictions in the four Gulf rivers with warm water protocols (Restigouche, Nepisiguit, Miramichi and Margaree Rivers). 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 angling regulations have changed in recent years. For several years, angling regulations were set on a river-specific basis using a river classification system (Veinott *et al.*, 2013) where rivers were assigned a class (2, 4 or 6) and anglers were given six tags at the start of the season. In 2017, poor returns to monitored rivers resulted in the closure of all Atlantic salmon rivers to retention angling mid-season. In 2018, the angling season began with a retention limit of one salmon, no retention on non-scheduled rivers, and a reduction in the daily catch and release limit from four salmon to three. In 2019, the management plan for NL Atlantic salmon included a seasonal retention limit of one fish on Class 2 rivers and two fish on Class 4,6 and unclassified rivers, no retention on non-scheduled rivers and daily catch and release limits of three fish on Class 2, 4, 6 and unclassified rivers. In addition, the protocol for closing rivers to angling during periods of extreme environmental conditions (i.e. high-water temperatures and/or low water levels) changed from complete closures to restricting angling to morning hours (until 10 AM). The management plan for Atlantic salmon in the Newfoundland and Labrador Region in 2019 was rolled over into the 2020 season. In 2020, 12% of all potential angling days across all scheduled Atlantic salmon rivers were restricted to morning hours due to environmental conditions.

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 2020.

France (Islands of Saint Pierre and Miquelon)

Five professional and 81 recreational gillnet licences were issued in 2020 (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 Saint Pierre and Miquelon.

4.1.3 Catches in 2020

Canada

The provisional harvest of salmon in 2020 by all users is 103.9 t, approximately 4% higher than the finalized 2019 harvest of 99.8 t (Tables 2.1.1.1, 2.1.1.2; Figure 4.1.3.1). This is the third lowest catch in the time-series since 1960. The angling catch assumed for 2020 in Newfoundland and Labrador was the 2019 value. The 2020 harvest comprised 31 512 small salmon (54.9 t) and 10 176 large salmon (49.0 t). There has been a dramatic decline in harvest since 1988 as a result of the closure of commercial fisheries (year of complete 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 2020 was 58.7 t, higher than the 54.7 t reported in 2019 (Table 4.1.3.1). The percentage of large salmon by number (51.4%) in 2020 increased from 50.0% in 2019.

In Labrador, total catch from Indigenous fishers was estimated by raising the reported catch from logbooks to the total number of fishers (63% reporting rate in 2020). 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 2020 values will be updated when the reports are finalised.

Labrador resident subsistence fisheries

The estimated catch for the Labrador resident fisheries in 2020 was 1.7 t, similar to the harvest (by weight) reported for the previous three years. This represents approximately 633 fish, 38% large by number (Table 4.1.3.2).

Recreational fisheries

Harvest in recreational fisheries in 2020 totalled 23 522 small and large salmon (43.5 t). This harvest, by number, decreased 14% from the previous five-year mean, and is the third lowest in the time-series since 1974 (Table 4.1.3.3; Figure 4.1.3.2). The small salmon harvest was 22 605 fish. The large salmon harvest of 917 fish was 42% below the 2019 harvest, and these fish 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 2020, 59 627 salmon (38 012 small and 21 615 large) were estimated to have been caught and released (Table 4.1.3.4; Figure 4.1.3.3), representing 72% 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, 96% of the catch was released (retention permitted only in Québec), which was the highest value in the time-series (since 1984 closures in Maritimes and Newfoundland). Catch and release for a large proportion of the Maritimes are based on a five-year mean while Newfoundland and Labrador was based on 2019 value.

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.

Commercial fisheries

All commercial fisheries for Atlantic salmon remained closed in Canada in 2020 and the catch therefore was zero.

Unreported catches

The unreported catch for Canada totalled 27.1 t in 2020. 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 1.74 t (596 fish sizes combined) was reported for Saint Pierre and Miquelon in 2020, similar to 2019 (Tables 2.1.1.1, 4.1.2.1) and the seventh 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 2020) 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 broodstock) 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 2020.

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 2000 and 2020 (Table 4.1.4.1; Figure 4.1.4.1). The percentage of the 2SW harvest equivalents taken in North America has varied from 44% to 63% of the total removals in all fisheries during 2008 to 2020 (Figure 4.1.4.1).

In the most recent 2SW harvest year (2020), the losses of 2SW salmon in terminal areas of North America was estimated at 9900 fish (median), 45% of the total North American catch of 2SW salmon. The percentages of harvests occurring in terminal fisheries ranged from 17 to 44% during 1973 to 1992 and 44 to 86% during 1993 to 2020 (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 2020 is 61% (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 39% to 51%. For similar years, the harvests in the Labrador subsistence fisheries have been 26 to 32% of the total harvests and 17% to 23% 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 programme

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 2020, a total of 999 samples (7% of harvest by number) were collected from the Labrador subsistence fisheries: 106 from northern Labrador (SFA 1A), 176 from Lake Melville (SFA 1B), and 717 from southern Labrador (SFA 2). The samples represent 7.3% of the catch by number (10.0% of small salmon, 3.9% of large salmon).

Size group	Statistics	2020
Small salmon	Samples (#)	758
	Catch (#)	7558
	% of catch	10.0%
Large salmon	Samples (#)	241
	Catch (#)	6154
	% of catch	3.9%
Small and large salmon	Samples (#)	999
	Catch (#)	13 712
	% of catch	7.3%

Not all scales can be interpreted for sea age and/or river age. Based on the interpretation of the scale samples (n=990), percentage sea age composition was 0.2% 0SW, 75.9% 1SW, 19.4% 2SW, 0.3% 3SW and 4.2% previously spawned salmon. All of the salmon samples that were interpreted for river age (n=979) were 2 to 6 years (modal age 4, 51%). There were no river age 1 and few river age 2 (n=6) salmon sampled, suggesting, as in previous years (2006 to 2019), that very few salmon from the most southern stocks of North America (USA, Scotia-Fundy) were exploited in these fisheries.

Labrador: Sample summary 2020								
Area	Number of Scale Samples	River Age (percentage of samples)						
		1	2	3	4	5	6	7
Northern Labrador (SFA 1A)	101	0.0	1.0	11.9	59.4	27.7	0.0	0.0
Lake Melville (SFA 1B)	170	0.0	1.8	22.9	55.3	20.0	0.0	0.0
Southern Labrador (SFA 2)	708	0.0	0.3	16.7	48.6	30.8	3.7	0.0
All areas	979	0.0	0.6	17.3	50.9	28.6	2.7	0.0

In 2020, only tissue samples collected from the Labrador subsistence fisheries along the coast (SFA 1A and 2) were analysed for genetic origin as the interception of non-Labrador origin salmon has been more prevalent in this area in the past. A total of 741 tissue samples 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). Emphasis was placed in 2020 on genotyping samples from the coastal areas (SFA 1A, 2) where interception of non-local stocks has been more prevalent in the past at the exclusion of sampling from the estuarine portion of Labrador located in Lake Melville (SFA 1B) for which the catches were previously assigned to that area. The estimated percent contributions (and associated 95% credible interval) to each reporting group in 2020 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 2006–2019 which estimated >95.0% of the catch was attributable to Labrador stocks (ICES, 2019, 2020). Furthermore, assignment of harvest within the two coastal Labrador genetic reporting groups (Labrador Central and Labrador South) suggest largely local harvest within salmon fishing areas.

Over the period 2015 to 2020, the percentages of the Labrador subsistence food fishery catches sampled and analysed for genetic reporting group has ranged from 2.1% to 4.8% for size groups combined, and 2.5% to 4.7% for large salmon specifically (Table 2.3.4). The percentage of the catch which is processed for stock origin (3.8%), is generally less than the percentage of the catch sampled (7% by number) due to resource constraints. The sampling and analysis rate in 2020 is higher for small salmon than large salmon but the sampling rate in 2020 for large salmon was among the highest of recent years (Table 2.3.4.1).

Labrador Subsistence fishery sampling for genetic stock identification (*2020 catches do not include Lake Melville)				
Size group	Statistics	2018	2019	2020*
Small salmon	Samples	325	329	582
	Catch	8780	7050	4673
	% of catch	3.7%	4.7%	12.4%
Large salmon	Samples	153	146	158
	Catch	4077	5808	3397
	% of catch	3.8%	2.5%	4.6%
Small and large salmon	Samples	499	485	741
	Catch	12 858	12 858	8070
	% of catch	3.9%	3.8%	9.2%

Saint Pierre and Miquelon fisheries sampling programme

A total of 116 samples were collected from the Saint Pierre and Miquelon salmon fishery between 28 May and 10 July 2020 and were representative of the reported catch by size class (60.7% small salmon and 39.3% large salmon, by weight). Based on the interpretation of the scale samples, percentage sea age composition was 58% 1SW and 38% 2SW, and 4% previously spawned salmon (all 1SW). River ages ranged from one to five years (modal age 2). The samples collected were not received in time for genetic analyses. These samples will be analysed and reported with the 2021 samples.

Saint Pierre and Miquelon: Sample summary 2020									
Size group	Number of Samples (#)	Percent of Samples (%)	Virgin Sea Age (%)		River Age (%)				
			1SW	2SW	1	2	3	4	5
Small salmon (<63 cm)	65	57.0	100.0	0.0	0.0	20.0	44.6	32.3	3.1
Large salmon (≥63 cm)	49	43.0	5.3	95.7	2.0	44.9	44.9	8.2	0.0
All	114	100	71.9	28.1	0.9	30.7	44.7	21.9	1.8

Recommendations for future activities

The Working Group continues to recommend 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.

An analysis of sampling programs for mixed stock fisheries that exploit salmon that comprise a low proportion of the exploitable pool of fish is described in Section 2.3.4. The concern is the impact of the catch of USA origin salmon at Labrador on the salmon population of the USA. Atlantic salmon in USA are listed as endangered under national legislation with returns of 2SW salmon substantially below the 2SW conservation limits and below the defined rebuilding objectives. Over the most recent two decades, the annual returns of large salmon to rivers in USA have averaged approx. 1000 fish. For the Labrador fishery, the proportion of USA origin are estimated to comprise less than 0.5% of the fishery samples (2006–2020) and the sampling rates have generally been less than 5% of the catches. In the absence of sampling and analysing every fish caught for origin, the posterior distribution of estimated catch of USA origin fish will always include values of catch greater than zero even when no USA origin salmon are assigned to samples. Positively biased and imprecise estimates of catches of USA origin salmon are obtained from the current realized sampling rates and low proportions of USA origin salmon in the samples (Section 2.3.4). It is a challenging task to estimate occurrences of rare events as is the case of USA fish in the Labrador subsistence fishery. A sampling rate of 10% or higher would be required to provide a less positively biased estimate of the catch under current catch values and proportions USA origin salmon in the pool of fish exploited.

4.1.6 Exploitation rates

Canada

In Québec, total fishing exploitation rate was estimated at 13%, the lowest value since 1985, with rates of 6% for the Indigenous fishery and 6% for the recreational fishery. The recreational exploitation rate for large salmon in Québec was 2%, 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 and the reduced fishing activities in the northern Québec area due to COVID-19 restrictions. Retention of small and large salmon in the recreational fisheries of Nova Scotia, New Brunswick and Prince Edward Island was not permitted in 2020.

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 2020 time period were calculated by dividing annual estimated losses (harvests, estimated mortality from catch and release (ICES, 2010), broodstock 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 12% 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 m² 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 m² 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 Stock Reference points, expressed in number of eggs, to regulate large salmon retention (MFFP, 2016). This Upper Stock Reference point is also used to establish the 2SW spawner requirement for advice on the management of the 1SW non-maturing fisheries at Greenland.

Country and Commission Area	Stock Area	2SW spawner requirement (number of fish)	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 73 rivers in eastern North America in 2020.

4.3.1 Smolt abundance

Canada

Wild smolt production was estimated in two rivers in 2020 (Table 4.3.1.1). In 2020, the relative smolt production, standardized to the size of the river using the CL egg requirements, was similar for the two rivers, de la Trinite River (Québec) and St. Jean (Québec) (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, 1989–2020; de la Trinite, 1984–2020) 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 2020, smolt production was not 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 5). 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. 2014–2019 data were corrected and finalized). In 2020, some regions were affected by the COVID-19 global pandemic and had to either modify the way returns estimates were produced (e.g. SFA15 using snorkel counts of spawners instead of angling data) or could not provide returns estimates (e.g. SFA 16, 17, 18, 19–21 and 23). When no data were available, the previous five-year mean was used for all SFAs, except for Newfoundland where the previous six-year mean was used.

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. In 2020, returns to Sand Hill River were not monitored due to COVID-19, therefore, 2020 estimates of total returns to southern Labrador are based on returns to two monitored rivers. 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.

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. Caution is warranted in interpreting the 2020 returns and spawners in some regions including Gulf, Scotia-Fundy, and Newfoundland as the 2020 assessments were hampered by the COVID-19 pandemic and means from the previous years were used to infer status in 2020.

Small salmon returns

- The total estimate of small salmon returns to North America in 2020 (456 100) and the 2020 estimate ranks eighteenth highest of the 50-year time-series.
- Small salmon returns decreased markedly (41%) in 2020 from the previous year in the USA.
- Small salmon returns in 2020 were among the highest (ninth highest) for Labrador and among the lowest for Gulf and Scotia-Fundy (eighth and fifth lowest, respectively).
- Over the previous five years, small salmon returns to Labrador (197 900) and Newfoundland (202 400) combined represented 88% of the total small salmon returns to North America.

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) while estimated abundances have strongly declined on the south coast (SFA 10–12) and the eastern portion of the island (SFA 6–9) while remaining stable in the western portion of the island (SFA 13 and 14A), 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%	34%	7%	21%
1980–1989	30%	40%	7%	23%
1990–1999	35%	44%	5%	16%
2000–2009	43%	44%	2%	11%
2010–2019	37%	51%	3%	9%

Large salmon returns

- The total estimated large salmon return to North America in 2020 of 155 600 fish was the twenty-fifth of the 50-year time-series beginning in 1971.
- Large salmon returns in 2020 increased from the previous year in Labrador (69%), Québec (27%), and USA (30%).
- Large salmon returns in 2020 were the eighth highest (45 600) of the 50-year time-series for Labrador, the fifteenth lowest for USA and the thirty-first highest for Québec.
- On average of the previous five years, large salmon returns to USA and Scotia-Fundy combined represented 2% of the total large salmon returns to North America.

2SW salmon returns

- The total estimate of 2SW salmon returns to North America in 2020 was 94 700.
- 2SW salmon returns increased from the previous year in Labrador (69%), Québec (27%), and USA (28%).
- 2SW salmon returns to NAC in 2020 were the twentieth lowest on record (50 years).
- On average of the previous five years, 2SW salmon returns to Labrador (29 700), Québec (28 300), and Gulf (31 200) combined represented 94% of the total estimated 2SW salmon returns to North America. There are few 2SW salmon returns to Newfoundland, as the majority of the large salmon returns to that region are comprised of previously spawned 1SW salmon.

4.3.3 Estimates of spawning escapements

Updated estimates for small, large and 2SW salmon spawners (1971 to 2020) 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 2020 for North America (425 600) and the 2020 estimate ranks seventeenth (descending rank) of the 50-year time-series.
- Estimates of small salmon spawners decreased in 2020 from the previous year in USA while they increased in Labrador and Québec.
- Small salmon spawners in 2020 were the fifteenth lowest on record for USA.

- On average of the previous five years, small salmon spawners for Labrador (196 600) and Newfoundland (179 900) combined represented 88% of the total small salmon spawners estimated for North America.

Large salmon spawners

- The total estimate of large salmon spawners in North America for 2020 (149 200), the tenth highest amount in the 50-year time-series.
- Estimates of large salmon spawners increased from 2019 in Labrador (70%), Québec (31%) and USA (20%).

2SW salmon spawners

- The total estimate of 2SW salmon spawners in North America for 2020 was 90 200 and was below the combined 2SW CL for NAC (143 494).
- Estimates of 2SW salmon spawners increased from 2019 in Labrador (70%), Québec (31%), and USA (18%).
- 2SW salmon spawners to NAC in 2020 were the fifteenth highest on record (1971–2020; 50 years).
- Estimates (median) of 2SW salmon spawners were below the region-specific 2SW CLs in Labrador (85% of CL) Québec (78% of CL) and USA (5% of CL). The estimated 2SW spawners in Labrador exceeded the 2SW CL every year during 2013 to 2017. The 2SW CLs were last exceeded in 2019 for Newfoundland, 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 have not been met since 1991 for Scotia-Fundy, and 1990 for 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 2020

Egg depositions by all sea ages combined in 2020 exceeded or equalled the river-specific CLs in 40 of the 73 assessed rivers (55%) and were less than 50% of CLs in 23 rivers (32%) (Figure 4.3.4.1). Large deficiencies in egg depositions (<10% CLs) were noted in 16 assessed rivers (22%).

- CLs were met or exceeded in two of three (67%) assessed rivers in Labrador, seven of 14 rivers (50%) in Newfoundland, 30 of 36 rivers (83%) in Québec and one of four rivers (25%) in Scotia-Fundy. There were no rivers assessed in the Gulf region in 2020.
- Large deficiencies in egg depositions were noted in the USA. All 16 rivers for which proportion of their CLs was assessed were below 30%. All anadromous Atlantic salmon fisheries in the USA are closed.
- In 2020, 57 rivers were assessed in Canada which is the lowest number of assessed rivers in the entire time-series.

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 57 to 91 and the annual percentages of these rivers achieving CL has ranged from 26% to 67% (70% in 2020) 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 fifteen rivers with the most precise adult abundance estimates.

4.3.5 Return rates

In 2020, return rate estimates were available from eight 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 recent years, returns rates in Scotia-Fundy region could not be calculated.

The US smolt to adult return rate metric for the Penobscot River hatchery origin smolts has previously been calculated by dividing the subsequent adult returns per sea age group by the total smolts stocked. The resulting estimate incorporated losses in the marine environment as well as losses in freshwater, which can be substantial (Stich *et al.* 2015). A revised smolt to adult return rate metric for the Penobscot River hatchery origin smolts was presented to the Working Group in 2021. These revised estimates were updated using the methods of Stevens *et al.* (2019) to decouple losses of smolts in-river and in the estuary to provide an estimate of post-smolts entering the Gulf of Maine. This method accounted for stocking location and subsequent natural mortality in the riverine and estuarine environments and flow-specific mortality related to dam passage. The resulting post-smolt estimates were then applied to subsequent age-specific adult returns to calculate post-smolt to adult return rates. This approach provides a better estimate of marine return rates as it removes the freshwater effects associated with stocking location, dams and other river/estuary impacts.

In 2020, the return rate of hatchery-origin 2SW salmon to the Penobscot River (USA) was 0.22%, the highest estimate since 2010 (Table 4.3.5.4; Figure 4.3.5.2). An estimate of the return rate of hatchery-origin small salmon to this river was not available at this time for 2020. The return rate of hatchery-origin small salmon to the Saint John River (Scotia-Fundy, SFA 23) increased from 0.15% in 2019 to 0.67% in 2020 (Table 4.3.5.3; Figure 4.3.5.2). Hatchery-origin 2SW return rates for the Saint John (Scotia-Fundy) increased from 0% in 2018 and 2019 to 0.06% in 2020 (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 2020 (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 outside of SFA 11 in 2020 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 2020 (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 2019/2020 (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 three years;

- In Scotia-Fundy and USA, hatchery-origin smolt return rates to 2SW salmon have decreased over the period 1970 to 2020 (2SW, $p < 0.001$). 1SW return rates for Scotia-Fundy hatchery stocks have also declined for the period ($p < 0.001$), 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 5). Estimates of returns and spawners to regions were provided for the time-series to 2020. The full set of data inputs are included in the Stock Annex 5 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 2019. This is because PFA estimates for 2020 require 2SW returns to rivers in North America in 2021.

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 2019 was 148 100 salmon (90% C.I. range 133 100 to 164 500). This value is 35% higher than the revised value for 2018 (109 400) and 1% higher than the previous five-year mean (146 700). The estimated non-maturing 1SW salmon in 2019 is the eighteenth lowest of the 49-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 2020 was 478 300 fish, 3% below the previous five-year mean (491 400). Maximum abundance of the maturing cohort was estimated at over 911 000 fish in 1981 and the recent estimate is the tenth lowest of the 50-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 1971–2019 (2020 PFA requires 2SW returns in 2021) 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 2019, was 562 400 fish, 12% lower than the previous five-year mean (639 600). The 2019 PFA estimate ranks 38 (descending rank) in the 49-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 2020 confirms the previous assessment of status from 2019 (ICES, 2019) and shows a persistent low abundance of all sea age groups of Atlantic salmon in North America.

In 2020, the median estimates of 2SW returns and of 2SW spawners to rivers were below the respective 2SW CLs in five assessment regions of NAC, and are therefore suffering reduced reproductive capacity (Figure 4.3.7.1) whereas estimates in Gulf were above the 2SW CLs. The percentages (based on medians) of CLs attained from 2SW spawners in 2020 ranged from a low of 10% in Scotia-Fundy to 161% in Gulf. For 2SW salmon returns to rivers prior to in-river exploitation, the percentages of CL attained were minimally higher, ranging from 10% to 166%, respectively. The returns of 2SW salmon to the two southern areas (Scotia-Fundy and USA) were 10% and 32%, 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 2020 time-series and the proportions of the 2SW CLs achieved in 2020 for six assessment regions in North America are shown below.

Region	Rank of 2020 returns in 1971 to 2020, (49=LOWEST)		Rank of 2020 returns in 2011 to 2020 (10=LOWEST)		Median estimate of 2020 2SW spawners as percentage of Conservation Limit (% of management objective)
	1SW	2SW	1SW	2SW	(%)
Labrador	9	8	6	8	85
Newfoundland	21	39	6	8	70
Québec	29	31	4	3	78
Gulf	42	23	3	3	161
Scotia-Fundy	45	45	5	7	4 (10)
USA	36	26	7	2	5 (32)

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 1992 to 2019 (moratorium in effect), the total population of 1SW and 2SW Atlantic salmon was 615 000 fish, less than half of the mean abundance (1 253 000 fish) during 1971 to 1991.

The estimated maturing 1SW salmon abundance in 2020 of 478 300 fish is 16% above the 2019 estimate and the ninth lowest abundance of the 50-year time-series, beginning in 1971. Overall, 88% of 1SW (small) salmon returns to NAC in 2020 were from two regions (Labrador and Newfoundland).

The non-maturing 1SW PFA for 2019 (fish mostly destined to be 2SW salmon in 2020) increased by 35% from 2018, and is the eighteenth lowest of the 49-year time-series. Over the previous five years, 94% of 2SW salmon returns to NAC were from three regions (Gulf, Labrador and Québec).

The estimates of 1SW (small) salmon returns in 2020 increased from 2019 in Labrador and Québec and decreased in USA. 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 2020 were the fourth 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 2020 relative to 2019 increased in Labrador, Québec and USA.

Wild smolt-to-adult return rates to monitored rivers in eastern North America remain low, with 2019 smolt to 1SW salmon returns ranging from 0.6% for multi-sea-winter salmon stocks to 13.7% for 1SW salmon stocks and return rates of smolts in 2018 to 2SW salmon for the two rivers with data ranging from 0.3% to 2.0%. A number of monitoring programs in 2017 and 2018 were unable to estimate smolt production due to exceptional spring discharge conditions, and in particular in 2020 due to the COVID-19 pandemic which weakens the critical metrics of adult return rates for the few monitored populations.

Egg depositions by all sea ages combined in 2020 exceeded or equalled the river-specific CLs in 40 of the 73 assessed rivers (55%) and were less than 50% of CLs in 23 rivers (32%). Large deficiencies in egg depositions (≤10% CLs) were noted in multiple (16) 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).

Based on previous five years, regional return estimates are reflective of the overall return estimates for NAC, as Labrador and Newfoundland collectively comprised 88% of the small salmon returns, whereas Labrador, Québec, and Gulf collectively comprised 82% of the large salmon returns and 94% of the 2SW salmon returns to NAC.

Overall, the estimated PFA of 1SW non-maturing salmon in 2019 was the eighteenth lowest of the 49-year time-series and the estimated PFA of 1SW maturing salmon was the tenth 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.

4.4 NASCO has asked ICES to provide catch options or alternative management advice for 2021–2024 with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding

Catch options are only provided for the non-maturing 1SW and maturing 2SW components as the maturing 1SW component is not fished outside homewaters, and in the absence of significant marine interceptory fisheries, is managed in homewaters.

As the predicted number of 2SW salmon returning to North America in 2021 to 2024 is substantially lower than the 2SW CL there are no catch options for the composite stock in the North American fisheries. Where river-specific spawning requirements are being achieved, there are no biological reasons to restrict the harvest.

Wild salmon populations are now critically low in the southern regions (Scotia-Fundy, USA) of North America and the remnant populations require alternative conservation actions including habitat restoration, captive rearing strategies, and very restrictive fisheries regulation in some areas in order to maintain the genetic integrity of the stocks and improve their chances of persistence.

Advice regarding management of this stock complex in the fishery at West Greenland is provided in Section 5.

4.4.1 Relevant factors to be considered in management

The management for all fisheries should be based upon assessments of the status of individual stocks. Fisheries on mixed-stocks, particularly in coastal waters or on the high seas, pose particular difficulties for management as they target all stocks present, whether or not they are meeting their individual CLs. Conservation would be best achieved if fisheries target stocks that have been shown to be meeting CLs. Fisheries in estuaries and especially rivers are more likely to meet this requirement.

The salmon caught in the Labrador subsistence fisheries are predominantly (>95%) from rivers in Labrador although there is occasional attribution of salmon in the sampled catches from other areas, including the USA.

The salmon caught in the Saint Pierre and Miquelon mixed-stock fisheries originate in all areas of North America. All sea age groups, including previous spawners, contribute to the fisheries in varying proportions.

4.4.2 Updated forecast of 2SW maturing fish for 2021

It is possible to provide catch options for the North American Commission area for four years. The updated forecast for 2021 for 2SW maturing fish is based on an updated forecast of the 2020 pre-fishery abundance and accounting for fish which were already removed from the cohort by fisheries in Greenland and Labrador as 1SW non-maturing fish in 2020. The updated forecast of the 2020 pre-fishery abundance has a PFA mid-point of 186 200 fish, 20% below the forecast PFA value provided in the 2018 assessment (231 500) (ICES, 2018). The surviving 2SW salmon from the 2020 pre-fishery abundance of non-maturing 1SW will be available in 2021.

4.4.2.1 Catch options for 2021 fisheries on 2SW maturing salmon

As the 5th percentiles of the predicted numbers of 2SW salmon returning to North America in 2021 are lower than the 2SW management objectives for all areas and overall for North America, there are no catch options on 2SW salmon in mixed-stock fisheries in North America in 2021 that would allow the attainment of region-specific management objectives (Table 4.4.2.1). A limited catch option may be available on individual rivers where spawning requirements are being achieved; in these circumstances, there are no biological reasons to further restrict the harvest.

4.4.3 Pre-fishery abundance of 2SW salmon for 2021–2023

4.4.3.1 Forecast models for pre-fishery abundance

ICES (2009; 2012; 2015; 2018) developed estimates of the pre-fishery abundance for the non-maturing 1SW salmon (PFA) using a Bayesian framework that incorporates the estimates of lagged spawners and works through the fisheries at sea to determine the corresponding returns of 2SW salmon, conditioned by fisheries removals and natural mortality at sea. This model considered regionally-disaggregated lagged spawners and returns of 2SW salmon for the six regions of North America. Dataseries were finalised for 2020 and updated for past years in some regions. The estimated 2SW returns to several regions of NAC in 2020 are based on averages of previous years as many monitoring programs were either delayed or cancelled as a result of the COVID-19 pandemic (see Section 2.3.1, Section 4.3.2).

Lagged spawners overall for NAC have generally been less than half the 2SW conservation limit for NAC (Figure 4.4.3.1). The lowest lagged spawner values were estimated during the 2003 to 2013 PFA years, with a slight improvement in abundance for the 2015 to 2016 and higher values for the 2020 to 2023 PFA years. The improvements in 2SW spawners in Labrador during 2013 to 2017 are now accounted for in the lagged spawners and these are the major contributors to the increased number of lagged spawners for NAC in the 2020 to 2023 PFA years.

North American and region-specific PFA and productivity value inferences are provided by the model (Figures 4.4.3.2 to 4.4.3.6).

The productivity coefficient (log of PFA to LS) was highest in most regions prior to 1990 (PFA year) and decreased in all regions to reach the lowest values in the late 1990s and early 2000s (Figure 4.4.3.2). Productivity coefficient values near zero or negative (negative value means the PFA estimate was less than the lagged spawners) were estimated for Labrador and Newfoundland in the early 2000s, for Gulf during 1997 to 2000, and for Scotia-Fundy and the USA during the 1990s and again after the 2010 PFA year. The most recent year values (2019 PFA year) are positive for all regions of NAC (Figures 4.4.3.2, 4.4.3.3). The productivity coefficient for NAC overall was negative in 2001, improved from that point onward, but declined again in 2011 to 2017 before increasing into 2019 (Figures 4.4.3.3, 4.4.3.4).

The regional contributions to the overall NAC PFA were relatively stable over the period 1980 to 2008 with over 70% of total PFA contributed by Québec and Gulf regions, followed by Labrador with over 20% of the overall PFA (Figure 4.4.3.5, 4.4.3.6). The Scotia-Fundy region contributed as much as 20% of the PFA for the 1984 PFA year but through the 2000s, has represented less than 5% of the total PFA and the USA has never represented more than a few percent of the total (Figure 4.4.3.6). For the PFA years 2010 to 2019, there has been an increasing proportion of the estimated PFA originating in Labrador and decreases in Québec (Figure 4.4.3.6).

The overall productivity estimate for NAC in the most recent year PFA (2019) increased to a high positive value (median = 0.65; 1.9 fish at the PFA stage per lagged spawner) equal to that estimated previously during the 2007 to 2009 PFA years (Figure 4.4.3.3, 4.4.3.4). By region, the most recent year value for the productivity was improved relative to the previous decade for Québec, Gulf, Scotia-Fundy and USA while it remained low for Labrador or equal to values from the previous decade for Newfoundland. In all regions, the productivity value is low but positive compared to the estimates of the 1980s (Figure 4.4.3.2, 4.4.3.4).

For 2021 to 2023 PFA years, the 5th percentiles of the posterior distributions of the regional PFAs are less than the management objective reserves for Scotia-Fundy and USA. In addition, the 25th percentiles are below the objectives for Gulf (Figure 4.4.3.5; Table 4.4.3.1).

For NAC overall, the predicted values (5th and 25th percentiles) for 2021 to 2023 are all substantially below the 2SW CL reserve (Table 4.4.3.1).

The forecasts have very high uncertainty and the uncertainties increase as the forecasts move farther forward in time.

4.4.3.2 Catch options for non-maturing 1SW salmon

Catch options on non-maturing 1SW salmon in North America in 2021 to 2023 and on surviving 2SW salmon in 2022 to 2024 are presented relative to the probability that the region-specific PFA estimates will meet or exceed the 2SW management objectives for the regions, in the absence of any mixed-stock fisheries exploitation at sea. The probabilities that the returns of 2SW salmon to the six regions of NAC will meet or exceed the 2SW objectives for the six regions in NAC, and simultaneously for all regions, in the absence of any fishing on the age group for the 2SW salmon return years 2021 to 2024 are provided in Table 4.4.3.1. The management objectives, corrected to the PFA time period for eleven months of natural mortality of 0.03 per month, are provided in Table 4.4.3.1, together with the 5th and 25th percentile and median values of the predicted PFA abundances by region. The 5th percentiles are below the management objectives for all six regions of North America in all years 2021 to 2023.

There are, therefore, no mixed-stock fishery options on 1SW non-maturing salmon in 2021 to 2023 or on 2SW salmon in 2022 to 2024 which would provide a greater than 95% chance of meeting the individual management objectives; the probability of simultaneous attainment in any year is less than 0.7% (Table 4.4.2.1).

4.4.4 Comparison with previous assessment and advice

In this assessment, updated and revised values of returns and spawners were obtained from run reconstruction (see Section 4.3.2). For the 2020 assessment year, previous five-year mean values were used in a few regions because of the impact of the COVID-19 pandemic on field programs. For the Québec region, the time-series of returns and spawners for 1984 to 2020 was revised using an alternate method of raising river-specific estimates of returns and spawners to region wide totals; the most obvious effect of the change was a reduction in the uncertainties in the annual estimates.

The 2SW CLs for Gulf and Québec were revised in 2019, with a slight increase for Québec (from 29 446 to 32 085 2SW fish) and a substantial decrease for Gulf (from 30 430 to 18 737 2SW fish). These changes in 2SW CLs are described in ICES (2019). The large change in the 2SW CL for Gulf results in an important change in perspective of the status for this region relative to the previous assessment. In ICES (2018), the 2SW spawners in Gulf were generally below the CL whereas in this assessment, the 2SW spawners are generally above the CL.

In 2018, the ICES Working Group provided forecasts of the regional productivity parameters and the regional specific PFAs based on the regional lagged spawners. The productivity parameter used in the forecast is the value derived from the last year in the model, with increasing uncertainty for each year of the forecast. In the 2018 assessment, the productivity parameter used for the 2018 to 2020 PFA years was negative for three regions (Gulf, Scotia-Fundy, USA), positive and at low values for Québec and Newfoundland, and high for Labrador (ICES, 2018). The returns of 2SW salmon in 2018 to 2020 were slightly higher than expected in all regions except Labrador and the realized productivity for the 2017 to 2019 PFA years was higher than predicted in 2018 (Figure 4.4.4.1). As a result, the estimated regional PFA values were lower in Labrador for the 2017 to 2019 PFA years and slightly higher in all the other regions. The larger overestimate for Labrador relative to the other regions resulted in a lower PFA value for NAC for those years than forecast in the 2018 assessment. Due to the large uncertainty associated with the forecast values, the estimated PFA values for 2017 to 2019 were within the 95% confidence intervals of the forecast values. Annual productivity estimates are highly variable among years and large changes in values have been observed over short time period, as in 2011 to 2017.

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 and this year's assessment confirms that advice.

4.5 NASCO has asked ICES to update the Framework of Indicators used to identify any significant change in the previously provided multiannual management advice

In 2007, ICES developed and presented to NASCO a framework (Framework of Indicators) to be used in interim years to determine if there is an expectation that the previously provided multi-year management advice for the Greenland fishery is likely to change in subsequent years (ICES, 2007).

The Framework of Indicators was last updated in 2018 (ICES, 2018), and NASCO has asked ICES to update this framework in 2020. Details on the updated Framework of Indicators used to identify significant changes in previously provided multiannual management advice are provided in Section 5.9.

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 2020. The data for 2020 are provisional.

Year	Number of licences		Reported Landings (t)		
	Professional	Recreational	Professional	Recreational	Total
1990			1.15	0.734	1.88
1991			0.63	0.530	1.16
1992			1.30	1.024	2.32
1993			1.90	1.041	2.94
1994			2.63	0.790	3.42
1995	12	42	0.39	0.445	0.84
1996	12	42	0.95	0.617	1.57
1997	6	36	0.76	0.729	1.49
1998	9	42	1.04	1.268	2.31
1999	7	40	1.18	1.140	2.32
2000	8	35	1.13	1.133	2.27
2001	10	42	1.54	0.611	2.16
2002	12	42	1.22	0.729	1.95
2003	12	42	1.62	1.272	2.89
2004	13	42	1.50	1.285	2.78
2005	14	52	2.24	1.044	3.29
2006	13	52	1.73	1.825	3.56
2007	13	53	0.97	1.062	2.03
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
2020	5	81	0.09	1.65	1.74

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 2020. The data for 2020 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	54.7	72	50
2020	58.7	73	51

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 2020. The data for 2020 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
2020	1.7	56	38

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 2020. The data for 2020 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
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	22 171	1 226	23 397	5
2020	22 605	917	23 522	4
Previous five-year mean	25 778	1 577	27 355	6

Table 4.1.3.4. Numbers of salmon caught and released in Eastern Canadian salmon angling fisheries, for the period 1984 to 2020. 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. Values for 2020 are preliminary (Québec) or based on previous five year mean (Nova Scotia, New Brunswick and Prince Edwards Island) or previous year (Newfoundland and Labrador) depending on the region due to COVID-19 restrictions (see text for details).

	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	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	30 784	6937	37 721	508	1564	2072	4506	3507	8013	68	68	136	2845	9849	12 694	38 711	21 925	60 636
2020 (prelim)	30 784	6937	37 721	471	1466	1937	5069	4995	10 064	68	68	136	1620	8149	9769	38 012	21 615	59 627

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 2020, 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 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
1972	21.9	13	144.2	166.2	0	0.4	0.6	27.4	20.2	5.6	54.3	0.3	220.8	25	197.8	418.6	53	292.4	0.76
1973	18.7	8	205.8	224.6	0	1	0.8	32.8	15.6	6.2	56.4	0.3	281.3	20	148	429.4	66	363.3	0.77
1974	23.7	9	236	259.7	0	0.8	0.5	47.9	18.1	13.1	80.3	0.2	340.3	24	186.7	527	65	449.6	0.76
1975	23.4	9	237.7	261.1	0	0.3	0.5	41.1	14.2	12.5	68.6	0.4	330.1	21	154.6	484.7	68	417	0.79
1976	34.9	12	256.7	291.6	0.3	0.8	0.4	41.9	16.1	11.1	70.3	0.2	362.5	19	194.7	557.2	65	431.3	0.84
1977	26.6	10	241.4	268	0	1.3	0.8	42.1	28.9	13.5	86.5	1.4	355.8	25	113	468.9	76	473.4	0.75
1978	26.9	15	157.4	184.3	0	0.8	0.5	37.6	20.4	9.4	68.7	0.9	253.9	27	142.9	396.8	64	317.5	0.8
1979	13.5	13	92.1	105.6	0	0.6	0.1	25.2	6.3	3.9	36.1	0.4	142.1	26	103.7	245.7	58	172.1	0.83
1980	20.6	9	217.3	237.9	0	0.9	0.6	53.6	25.4	17.4	97.9	1.5	337.3	29	141.9	479.2	70	451.9	0.75
1981	33.6	14	201.5	235.1	0	0.5	0.4	44.2	14.5	12.8	72.5	1.3	308.9	24	120.9	429.7	72	365.5	0.85
1982	33.5	20	134.5	168	0	0.6	0.4	35.1	20.6	8.9	65.6	1.4	235	29	161.2	396.2	59	291.2	0.81
1983	25.2	18	111.6	136.8	0.3	0.4	0.4	34.5	17.3	12.3	64.9	0.4	202.5	32	145.9	348.3	58	237.5	0.85
1984	19	19	82.9	101.9	0.3	0.5	0.2	19.2	3.6	3.9	27.4	0.7	130.3	22	26.8	157.2	83	199.5	0.65
1985	14.3	15	78.8	93.1	0.3	0.3	0	22.1	0.8	5.1	28.3	0.6	122.3	24	32.4	154.8	79	213.1	0.57

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-lantic Total	Harvest in home-waters as % of total NW At-lantic	Estimated abun-dance in North America (2SW)	Exploita-tion rate in North America
	Mixed-stock fisheries in North America					Canada – losses from all sources (terminal fish-eries, catch and release mortality, bycatch mor-tality) in year i													
1986	19.5	16	105	124.5	0.3	0.5	0	27.1	1.9	3	32.5	0.6	157.9	21	99	256.9	61	266.9	0.59
1987	24.7	16	132.3	157	0.2	0.6	0	27.1	1.9	1.4	31.1	0.3	188.6	17	123.7	312.3	60	260	0.73
1988	31.5	28	81.2	112.7	0.2	0.7	0	27.4	1.4	1.4	30.9	0.2	144.1	22	123.8	267.8	54	215.2	0.67
1989	21.9	21	81.4	103.3	0.2	0.5	0	23.6	1.2	0.3	25.5	0.4	129.4	20	84.9	214.2	60	195.8	0.66
1990	19.2	25	57.4	76.6	0.2	0.4	0	22.8	1.3	0.6	25.1	0.7	102.6	25	43.6	146.2	70	176	0.58
1991	11.8	23	40.5	52.3	0.1	0.1	0	23.4	1.1	1.4	26	0.2	78.7	33	52.2	130.9	60	148.4	0.53
1992	9.8	28	25.1	34.9	0.3	0.8	0.1	23.9	1.1	1.1	27.1	0.2	62.5	44	79.5	142	44	145.9	0.43
1993	3.1	19	13.3	16.4	0.3	0.4	0	18.4	0.7	1.2	20.7	0.2	37.6	56	29.8	67.4	56	122.1	0.31
1994	2.1	15	11.9	14	0.4	0.5	0.1	19.1	0.7	0.8	21.2	0	35.6	60	1.9	37.5	95	107.2	0.33
1995	1.2	12	8.7	9.9	0.1	0.5	0.1	17.8	0.5	0.4	19.3	0	29.2	66	1.9	31.1	94	134.3	0.22
1996	1	15	5.6	6.7	0.2	0.4	0.2	17.1	0.9	0.8	19.4	0	26.2	74	19.2	45.4	58	113.8	0.23
1997	0.9	14	5.6	6.5	0.2	0.2	0.2	14.1	0.8	0.6	15.9	0	22.6	70	19.3	41.9	54	93.9	0.24
1998	1.2	40	1.8	2.9	0.3	0.2	0.1	7.9	0.5	0.3	9	0	12.2	74	13	25.2	48	64.5	0.19
1999	0.2	17	0.8	1	0.3	0.3	0.1	6.6	0.7	0.5	8.2	0	9.4	86	4.3	13.8	69	68.3	0.14
2000	0.1	12	1.1	1.2	0.3	0.3	0.2	6.3	0.6	0.2	7.6	0	9	84	6.4	15.5	58	70.1	0.13

	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
2001	0.3	17	1.3	1.6	0.2	0.3	0.1	6.8	0.9	0.3	8.4	0	10.2	82	5.9	16.2	63	80.9	0.13
2002	0.3	19	1.1	1.3	0.2	0.2	0	4.2	0.5	0.2	5.2	0	6.7	77	8.6	15.3	44	51	0.13
2003	0.3	15	1.7	2	0.3	0.2	0.1	6.1	0.7	0.2	7.3	0	9.6	76	3.2	12.9	75	78.3	0.12
2004	0.3	11	2.9	3.2	0.2	0.3	0.1	6	0.9	0.1	7.3	0	10.7	68	3.5	14.2	76	76	0.14
2005	0.5	17	2.2	2.7	0.3	0.3	0.1	5.3	1	0.1	6.7	0	9.7	69	4.3	14.1	69	78.2	0.12
2006	0.6	19	2.4	3	0.5	0.2	0.1	4.9	0.8	0.2	6.1	0	9.5	64	4.2	13.7	69	74.7	0.13
2007	0.6	21	2.1	2.6	0.2	0.2	0.1	4.7	0.9	0.1	6	0	8.9	68	4.9	13.8	64	69.7	0.13
2008	0.5	14	3	3.5	0.4	0.2	0.1	4.5	0.8	0.1	5.7	0	9.7	59	6.6	16.3	59	76.8	0.13
2009	0.5	17	2.6	3.1	0.4	0.2	0.1	4.6	0.9	0.1	6	0	9.5	63	7.5	17	56	90.4	0.11
2010	0.4	13	2.9	3.3	0.5	0.2	0.1	4.2	0.8	0.1	5.4	0	9.2	59	6.7	15.9	58	73.3	0.13
2011	0.5	13	3.5	4	1	0.1	0.1	5.9	1.5	0.1	7.7	0	12.7	61	8.8	21.5	59	146.1	0.09
2012	0.6	16	3.3	3.9	0.2	0.1	0	4.5	0.7	0.1	5.3	0	9.4	57	6.9	16.2	58	76	0.12
2013	0.5	10	5	5.6	1.2	0.2	0.1	4.9	1	0	6.1	0	12.9	47	7.1	20	65	113.3	0.11
2014	0.4	12	3.1	3.5	0.6	0.1	0	3.5	0.6	0	4.3	0	8.4	51	9.6	18	47	83.9	0.1
2015	0.5	9	4.8	5.3	0.4	0.1	0.1	4.1	0.8	0	5.1	0	10.8	47	11.4	22.2	49	121.6	0.09

	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
2016	0.5	11	4.3	4.9	0.3	0.2	0.1	4.3	1	0	5.7	0	10.8	53	11.7	22.6	48	118	0.09
2017	0.4	8	4.8	5.3	0.1	0.2	0.1	3.8	1.1	0	5.2	0	10.5	49	5.6	16.2	65	117.8	0.09
2018	0.4	11	3.2	3.6	0.2	0.1	0	3.1	1.1	0	4.3	0	8.1	53	5.4	13.5	60	92.4	0.09
2019	0.5	10	4.5	5	0.2	0.1	0.1	3.1	0.7	0	4.1	0	9.2	44	9.6	18.8	49	70.8	0.13
2020	0.4	8	4.8	5.2	0.2	0.1	0.1	3.2	1.1	0	4.5	0	9.9	45	6.4	16.2	61	102.7	0.1

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
	Southern Norway	SNO
	Northern Norway	NNO
	Iceland	ICE
	Greenland	GL

Table 4.1.5.2. Genetic mixture analysis of Labrador subsistence fisheries for 2020 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. Samples were not analysed in 2020 in SFA 1B.

Reporting Group	Total	Small	Large	SFA 1A	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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
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)
Gulf of St Lawrence	0.2 (0.0, 0.6)	0.2 (0.0, 0.8)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.2 (0.0, 0.6)
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)
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)
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)

Reporting Group	Total	Small	Large	SFA 1A	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)
St Lawrence North Shore Lower	1.2 (0.4, 2.4)	1.1 (0.3, 2.3)	1.2 (0.1, 3.4)	0.0 (0.0, 0.0)	1.3 (0.4, 2.5)
Newfoundland 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)	0.0 (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)
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)
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)
Newfoundland 1	0.4 (0.0, 1.1)	0.2 (0.0, 0.8)	1.0 (0.0, 3.3)	0.0 (0.0, 0.0)	0.4 (0.0, 1.1)
Western New-foundland	0.4 (0.0, 1.1)	0.3 (0.0, 0.9)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.4 (0.1, 1.0)
Northern New-foundland	1.4 (0.7, 2.5)	1.7 (0.8, 3.0)	0.6 (0.0, 2.3)	0.0 (0.0, 0.0)	1.5 (0.7, 2.6)
Labrador South	**84.9 (81.4, 88.0)**	**87.5 (83.8, 90.8)**	**77.1 (68.9, 84.3)**	**0.0 (0.0, 0.0)**	**88.7 (85.6, 91.5)**
Lake Melville	1.7 (0.8, 3.1)	2.3 (0.9, 4.1)	1.4 (0.0, 4.0)	0.0 (0.0, 0.0)	1.7 (0.8, 2.8)
Labrador Central	**8.9 (6.2, 12.0)**	**6.3 (3.5, 9.5)**	**15.0 (8.5, 22.6)**	**95.3 (82.3, 99.9)**	**5.0 (2.9, 7.6)**
Ungava	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	2.4 (0.6, 5.3)	0.0 (0.0, 0.0)	0.4 (0.0, 1.0)
Samples	**741**	**582**	**158**	**28**	**713**

Table 4.3.1.1. Estimated smolt production by smolt migration year in monitored rivers of eastern North America 1991 to 2020.

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
2020											

Table 4.3.1.1 Cont`d. Estimated smolt production by smolt migration year in monitored rivers of eastern North America 1991 to 2020.

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
2020	38 110	38 892						

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 2020. 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	135.4	23.7	63	26.6	NA	298.9	34.1	120.1	19.4	54	22.8	NA	272.9	72.6	150.9	27.9	72	30.3	NA	328
1971	64.6	118.6	18.7	50	18.8	0	271.8	44.6	105.6	15.4	42.7	16	0	244.5	95.4	132	22.1	57	21.7	0	305.4
1972	48.7	110.7	15.5	62.9	17	0	255.6	33.9	97.5	12.8	53.7	14.1	0	231.6	71.7	123.3	18.4	72	19.8	0	283.5
1973	13.9	160.1	20.7	63.3	24.4	0	282.6	9.4	142.3	17	54.1	20.7	0	261.3	19.8	177.5	24.5	72.3	28.1	0	303.8
1974	53.7	120.7	20.9	98.2	43.5	0.1	338.4	37.6	107	17.2	83.8	37.2	0.1	309.2	79.8	134.2	24.8	112.9	50	0.1	371.8
1975	102.9	151.1	22.7	88.6	33.9	0.1	400.2	71.5	133.1	18.5	75.6	30.4	0.1	358.4	153.2	168.8	26.7	101.1	37.2	0.1	454.8
1976	73.4	158.6	25	128.9	52.8	0.2	440.8	51.2	139	20.5	110.8	46.5	0.2	401.5	108.9	178	29.4	146.6	59.1	0.2	484.4
1977	65.6	159.8	22.8	46.3	46.1	0.1	342.2	45.5	140	18.6	40.1	40.3	0.1	309.6	97.2	179.5	26.9	52.7	52.1	0.1	379.4
1978	33	139.3	21.2	41	15.8	0.2	251.5	22.8	121.9	17.4	36.2	14.5	0.2	228.2	48.2	156.8	25	46	17.1	0.2	274.9
1979	42.2	151.9	27.2	72.3	48.9	0.2	344	29.2	133.1	22.2	62.5	42.4	0.2	316	63.1	170.5	32	82	55.4	0.3	373.2
1980	96.3	172.6	37.2	63.2	70.6	0.8	442.1	66.4	152.5	30.5	54.5	62.8	0.8	400.3	142.8	192.5	43.9	71.9	78.5	0.8	493.9
1981	105.3	225.5	52.1	106.5	59.4	1.1	552.4	72.8	197.6	42.7	85.4	51	1.1	498.1	157.2	253.7	61.5	127.5	67.8	1.1	615.5
1982	73	200.3	29.6	121.5	36.1	0.3	462.8	50.5	177.1	24.3	96.3	31.4	0.3	417.6	108.8	224.2	34.9	146.1	40.8	0.3	512.3
1983	45.6	156.5	22.5	37.3	22.6	0.3	285.8	31.8	137.9	18.5	29.7	19.8	0.3	259.2	68.3	175.2	26.5	44.7	25.4	0.3	316.1
1984	24	206.4	25.5	54.3	42.8	0.6	354.3	16.7	180.3	24.5	44.6	36.7	0.6	324.9	35.5	232.9	26.5	63.8	49	0.6	384.6
1985	43	195.4	27.5	86.4	47.5	0.4	401.6	29.7	168.5	26.4	68.3	40.1	0.4	364.4	64.8	222.7	28.7	104.1	54.7	0.4	440.9
1986	65.6	200.6	38.5	161.3	49.2	0.8	518.1	45.2	175.3	37	127	41.7	0.8	465.7	97.8	226	40	195.1	56.8	0.8	570.9
1987	82	135.6	44.1	123.8	51.4	1.1	439.7	56.5	118.6	42.3	98.6	43.4	1.1	395.2	122.8	152.5	45.9	148.8	59.3	1.1	490.5
1988	75.9	217.6	50.6	174	51.8	1	572.3	52.1	189.8	48.8	137.6	44	1	516.1	113.5	244.4	52.5	209.2	59.6	1	632.1
1989	51.7	107.6	40.1	103.8	54.5	1.3	360.3	35.8	94.9	38.6	81.7	46.6	1.2	326.1	77.1	120.4	41.6	125.3	62.6	1.3	396.6
1990	30.3	152.3	45.4	117.9	55.3	0.7	403.2	20.8	138.1	43.9	93.8	46.5	0.7	369.6	45.4	166.4	47	142.3	64	0.7	435.9
1991	24.4	105.8	36.4	86.1	28.2	0.3	281.8	16.6	96.4	35.2	68.3	24.5	0.3	258.6	36.5	114.9	37.7	103.8	32	0.3	305.5
1992	34.2	228.9	40	193.7	34	1.2	533.7	24.1	200.4	38.7	165.3	29.4	1.2	489.9	51.2	257.7	41.5	222.1	38.7	1.2	577.9
1993	45.9	265.9	34.6	136.6	25.7	0.5	511.2	33.3	235.5	33.4	90.5	21.9	0.5	451.6	66.8	295.1	35.7	184.4	29.5	0.5	571.6

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
1994	33.8	160.9	33	67.8	10.5	0.4	307.7	25.2	138.6	32	57.5	9.3	0.4	281.1	48.5	183	34	78.2	11.6	0.4	335
1995	48	204.7	26.6	61	20	0.2	362.1	36.1	173.9	25.7	52.3	17.5	0.2	326.3	67.2	234.6	27.4	70	22.5	0.2	397.5
1996	90	313.7	35.2	57.5	31.8	0.7	531.1	67.9	269.6	34.2	48.1	27.5	0.6	478.4	127.2	357.6	36.2	66.6	36.1	0.7	588.4
1997	95.3	176.9	27.6	31.1	9.4	0.4	341.6	73.7	158.7	26.7	25.1	8.3	0.4	310.7	130.3	194.3	28.5	37	10.5	0.4	380.9
1998	150.9	183.7	28.7	40.5	20.4	0.4	424.7	102.7	171.4	27.7	34.6	18.7	0.4	374.3	199.9	196	29.7	46.6	22	0.4	475.1
1999	146.7	201.3	30	36.3	10.6	0.4	425.2	100	185.6	28.9	31.6	9.8	0.4	375.2	195	217.2	31.1	40.9	11.4	0.4	476.2
2000	181.7	228.8	28	51.5	12.3	0.3	502.8	123.5	216.9	26.1	45.1	11.3	0.3	442.7	239.7	240.9	29.8	57.9	13.4	0.3	561.4
2001	145.2	156.2	18.9	42.8	5.4	0.3	369	98.7	148.1	18.2	37.6	5	0.3	321.3	191.7	164.5	19.6	48.2	5.8	0.3	415.8
2002	102.6	155.8	30.3	68.7	9.8	0.4	367.7	66.6	143.2	29.4	59.7	9	0.4	328.1	139	167.8	31.2	77.9	10.7	0.5	407.3
2003	85.8	242.4	25.3	41.5	5.8	0.2	400.9	51.9	233.1	24.5	35.9	5.3	0.2	365.2	119	252	26.1	47	6.3	0.2	435.8
2004	95.2	210	34.2	76.6	8.4	0.3	424.6	72.3	192.1	32.4	65.9	7.6	0.3	393	117.7	228	35.9	87.4	9.2	0.3	456.4
2005	220.5	221.9	23	47.1	7.5	0.3	520	165.9	176.5	21.9	39.2	6.8	0.3	446.3	275.4	266.4	24.1	55.2	8.2	0.3	592.9
2006	213.5	212.8	28.1	58.1	10.3	0.5	522.8	139.8	194.1	27	48.4	9.3	0.4	446.7	285.9	231.3	29.2	68	11.3	0.5	598.7
2007	195	183.8	21.4	41.4	7.7	0.3	449.3	138.3	158.6	20.3	33.2	7	0.3	386.9	251	208.6	22.5	49.6	8.5	0.3	511.6
2008	204	247.7	35.7	63.7	15.4	0.8	567.8	149	222.4	34.3	50.7	13.9	0.8	504.3	259.1	273.2	37.2	77	16.8	0.8	631.3
2009	103.1	222.9	20.8	25.4	4.2	0.2	376.3	59.9	194.4	19.8	20.4	3.8	0.2	322.5	144.9	250.9	21.9	30.6	4.6	0.2	429.2
2010	121.6	267.7	27.5	73.7	14.9	0.5	506.3	82.8	256.1	26.1	64.3	13.4	0.5	464	160.9	279.3	28.8	83.5	16.4	0.5	548.7
2011	245.4	243.1	36.9	76.7	9.4	1.1	612.2	148.3	216	35.4	62.4	8.5	1.1	510.7	345.6	270.7	38.4	90.4	10.4	1.1	719.1
2012	175.1	270.9	23.2	18.8	0.6	0	488.1	112.7	250.7	22.1	14.9	0.6	0	422.4	235.3	290.3	24.2	22.6	0.7	0	552.1
2013	155	187.9	18.8	24.4	2.1	0.1	388.4	90.7	172.5	17.8	19.4	1.9	0.1	321.8	219.8	203.3	19.7	29.5	2.3	0.1	455.8
2014	266.1	169.9	22	15	1.4	0.1	475	185.2	155.1	21	12.6	1.3	0.1	391.6	350.1	185	22.9	17.3	1.6	0.1	559.3
2015	258.6	283.1	36.9	39.5	4.2	0.2	621.9	183.1	253.5	35.5	34.9	3.8	0.1	540.4	331.3	312.9	38.2	44.3	4.6	0.2	700.8
2016	204.7	208.2	33.2	24.1	2.6	0.2	472.3	119.7	184	31.7	19.5	2.3	0.2	383.6	290.4	231.8	34.7	28.9	2.8	0.2	562.6
2017	161.8	191.8	24.4	22	3.9	0.4	405.3	88.5	158.9	23.2	18.4	3.5	0.4	323.4	238.2	224.5	25.5	25.7	4.3	0.4	488.9
2018	285.7	123.2	23.8	17.5	1.3	0.3	451.8	179.7	107.4	22.7	14.6	1.3	0.3	344.8	393.1	139	24.8	20.3	1.4	0.3	559.9

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	116	237.4	20.9	15.7	3.5	0.4	394	67.6	183.4	19.9	12.8	3.2	0.4	318.1	165.3	291.6	21.8	18.8	3.8	0.4	470
2020	197.9	202.4	26	25.9	3.1	0.2	456	138.1	174.8	24.9	22.2	2.8	0.2	387.6	256.6	230.8	27.2	29.6	3.4	0.2	521.1
% Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years mean)																					
	70%	*	25%	*	*	-41%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	9	21	29	42	45	36	18														

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 2020. 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	10.1	14.9	103.4	69.6	20.3	NA	218.8	5	11.8	84.8	67.1	18	NA	198.2	17.1	17.9	121.9	72	22.6	NA	238.8
1971	14.3	12.5	59.2	40.1	15.9	0.7	143.1	7.1	9.9	48.6	37.6	14.1	0.6	128.3	24.1	15.1	69.9	42.5	17.6	0.7	158.2
1972	12.3	12.7	77.2	57	19	1.4	180	6.1	10.1	63.4	48.9	17.1	1.4	161.2	20.8	15.2	91.1	65	20.8	1.4	198.8
1973	17.1	17.3	85.4	53.4	14.8	1.4	189.9	8.5	13.7	69.9	45.6	13.4	1.4	168.9	29.2	20.8	100.6	61.3	16.1	1.4	211.6
1974	17.2	14.3	114.5	77.6	28.5	1.4	254.1	8.3	12.7	93.9	65.9	26.3	1.4	226.8	28.8	15.9	134.7	89.4	30.8	1.4	280.9
1975	15.9	18.4	97.1	50.3	30.6	2.3	215.3	7.8	16.1	79.6	43.1	28	2.3	192.9	26.7	20.7	114.7	57.9	33.2	2.4	237.8
1976	18.3	16.6	96.2	48.8	28.8	1.3	210.7	9	14.7	79	41.5	26	1.3	188	31	18.6	113.8	56.1	31.6	1.3	234
1977	16.2	14.6	113.4	87.7	38.1	2	272.7	8	13	93.4	75.2	34.7	2	246.1	27.4	16.2	134.3	100.4	41.5	2	300.4
1978	12.7	11.4	102.8	43.8	22.2	4.2	197.4	6.4	10.3	84	38.8	20.6	4.2	175.8	21.4	12.4	120.9	48.8	24	4.2	218.3
1979	7.2	7.2	56.5	17.9	12.8	1.9	103.8	3.6	6.3	46.4	15.7	11.6	1.9	91.9	12.2	8.1	66.6	20	14	2	115.4
1980	17.3	12.1	134.2	62.5	43.8	5.8	276.4	8.5	11.1	110.2	54.8	39.5	5.7	247.9	29.2	13	158.6	70.2	47.9	5.8	304.6
1981	15.7	28.9	105.3	39.3	28.2	5.6	223.7	7.7	25.3	86.6	33	25.5	5.6	200.3	26.3	32.4	124.6	45.7	31	5.7	247.3
1982	11.5	11.6	93.6	54.2	23.7	6.1	201	5.7	10.1	76.8	42.9	21.6	6	178.3	19.5	13.1	110.4	65.4	25.8	6.1	223.7
1983	8.3	12.5	77	40.7	20.6	2.2	161.4	4.1	11.3	63.1	33.8	18.4	2.1	144.3	14.1	13.6	90.7	47.5	22.8	2.2	178.6
1984	6	12.4	64	32.7	24.5	3.2	143	2.9	9.2	62.2	23.3	21.2	3.2	131.4	10.1	15.6	65.8	42.1	27.9	3.3	154.5
1985	4.8	11	66.7	44.6	34.2	5.5	166.9	2.3	7.7	64.6	31.9	29.3	5.5	152.5	7.9	14.2	68.9	57.1	39.1	5.6	181.6
1986	8.2	12.3	78.3	68.7	28.2	6.2	201.9	4	9.4	76.4	49.1	23.9	6.1	181.1	13.7	15.1	80.2	87.9	32.7	6.2	223.1
1987	11	8.4	73.7	46.4	17.7	3.1	160.9	5.4	6.5	71.8	34	15	3.1	145.9	18.5	10.4	75.6	58.8	20.3	3.1	175.5
1988	6.9	13	81.3	53.5	16.4	3.3	174.6	3.4	9.9	78.9	39.5	13.7	3.3	159	11.6	16	83.6	67.7	19.2	3.3	190
1989	6.7	6.9	74	42.4	18.5	3.2	152.1	3.2	5.4	72.1	31.3	15.6	3.2	139.3	11.2	8.5	75.9	53.6	21.4	3.2	164.5
1990	3.9	10.3	72.8	56.5	16	5.1	164.5	1.9	8.3	70.1	39.7	13.5	5	146.9	6.4	12.2	75.4	73.5	18.5	5.1	182.5
1991	1.9	7.6	65.7	57.4	15.6	2.6	150.8	0.9	6.1	63.3	39.7	13.4	2.6	132.7	3.1	9	68.1	75.1	17.9	2.7	169.1
1992	7.5	31.5	65.8	60	14.3	2.5	181.9	4	22.1	63.5	51.3	12.3	2.4	167.8	12.7	40.8	68.2	68.5	16.3	2.5	195.9
1993	9.5	17.1	50.6	63.8	10.1	2.2	153.5	6	13.8	49.6	34.8	8.9	2.2	123.9	15.2	20.4	51.6	93.2	11.2	2.3	183.5

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	13.1	17.4	51.2	41.3	6.3	1.3	131.1	8.6	13.8	50.3	33.1	5.7	1.3	120.4	20.6	20.9	52.1	49.4	7	1.4	142.3
1995	25.8	19.1	59.2	48.2	7.5	1.7	162.3	18.3	14.7	58.2	41.3	6.6	1.7	150.1	38.2	23.3	60.3	55.2	8.4	1.8	176.5
1996	18.5	28.9	53.7	40.7	10.9	2.4	155.7	13.3	23.8	52.6	32.7	9.6	2.4	144.1	27	34	54.8	48.9	12.2	2.4	168.2
1997	16.3	28	44.4	35.9	5.6	1.6	132.2	11.6	22.9	43.6	28.2	5	1.6	121.4	23.8	33.1	45.3	43.3	6.2	1.6	143.4
1998	13.5	35.2	34	30.2	3.8	1.5	118.3	8	27.4	33.2	24.7	3.5	1.5	107	18.9	43.1	34.8	35.8	4.2	1.5	129.7
1999	16	32.1	37.2	27.4	4.9	1.2	118.9	9.6	25	36	23.2	4.6	1.2	108	22.6	39.2	38.4	31.7	5.3	1.2	129.5
2000	22.1	27	35.5	30.3	2.9	0.5	118.2	13.1	23	34	25.6	2.6	0.5	107.2	30.9	31.1	37	34.9	3.1	0.5	129.3
2001	23.3	17.8	37.3	40	4.7	0.8	123.9	13.9	15.1	36	35	4.3	0.8	112.6	32.6	20.5	38.6	44.9	5.1	0.8	135.2
2002	16.8	16.8	26.5	23.5	1.6	0.5	85.7	9.9	13.7	25.5	19.7	1.4	0.5	76.9	24	19.9	27.4	27.2	1.7	0.5	94.5
2003	14.1	24.4	42.1	40	3.5	1.2	125.4	7.4	19.3	40.5	33.6	3.2	1.2	114.6	20.9	29.4	43.7	46.3	3.9	1.2	136.3
2004	17.1	22.2	36.6	39.5	3.1	1.3	119.7	11.6	17	35.4	32.4	2.8	1.3	109.3	22.5	27.4	37.8	46.8	3.4	1.3	130.5
2005	21	28.4	35.5	38.3	2	1	126.1	12.1	20.5	34.3	31	1.8	1	112	29.8	36.2	36.6	45.3	2.2	1	140.3
2006	21.1	35.7	32.9	38	3	1	131.7	13.3	29.9	31.9	31.3	2.7	1	119.6	29	41.4	33.9	44.7	3.3	1	143.8
2007	21.9	29.6	30.2	34.9	1.6	1	119.1	13	23.3	29.2	29.6	1.5	0.9	106.9	30.9	35.7	31.1	40.2	1.7	1	131.5
2008	26.1	28.9	36.3	28.8	3.3	1.8	125.2	15.9	22.5	34.8	22.9	2.9	1.8	111.3	36.4	35.1	37.7	34.5	3.6	1.8	138.9
2009	39.4	34.6	35.1	36.2	3.1	2.1	150.4	20.7	24	33.9	30.6	2.8	2.1	127.7	58	44.9	36.3	42	3.4	2.1	173.3
2010	18.8	35.4	37.8	32.8	2.5	1.1	128.3	11.6	28.8	36.7	27.4	2.3	1.1	116.8	26	42	38.9	38.3	2.7	1.1	140
2011	57.9	43.5	47.7	67	4.8	3.1	224	33	31.3	46.4	53.5	4.3	3.1	192.7	82.4	55.5	49.1	80.5	5.3	3.1	254.9
2012	33.8	28.9	33.6	27.6	1.3	0.9	126.1	20.4	23.3	32.5	22.7	1.2	0.9	110.6	47	34.4	34.7	32.6	1.4	0.9	141.7
2013	64.4	37.7	38.5	35.9	3.2	0.5	180.3	39.6	25.8	37.4	28.6	2.8	0.5	151.3	88.7	49.8	39.6	43.2	3.5	0.5	209
2014	62.5	20.2	22.1	23.6	0.8	0.3	129.3	38.4	16.4	21.5	18.8	0.7	0.3	105	85.3	23.9	22.7	28.2	0.8	0.3	152.8
2015	88.7	36.8	36.4	33.7	0.7	0.8	197.1	53.5	29.2	35.3	27.9	0.7	0.8	160.6	124	44.6	37.5	39.6	0.8	0.8	233.6
2016	72.6	32	39.3	38.1	1.6	0.4	184	39.8	24.8	38	30.3	1.4	0.4	149.4	105.1	39.4	40.6	46	1.7	0.4	218.1
2017	77	22.2	38.1	35.3	1.2	0.7	174.3	36.5	16.9	36.8	29.5	1.1	0.7	132.8	116.7	27.6	39.4	40.8	1.3	0.7	214.7
2018	46.1	11.2	28.6	39.2	1.6	0.5	127.4	25.4	8.4	27.7	31.1	1.4	0.5	104.3	67.1	14	29.5	47.4	1.7	0.5	150.2
2019	27.1	30.7	30.6	23.2	0.7	1.1	113.4	14.2	20.8	29.6	17.9	0.7	1.1	95.8	40.4	40.7	31.5	28.6	0.8	1.1	131.3

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
2020	45.8	25.6	38.8	42.9	1.2	1.5	155.6	44.4	19.4	37.7	35.3	1	1.5	145.8	47.3	31.7	39.8	50.3	1.3	1.5	165.3
Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years mean)																					
	69%	*	27%	*	*	30%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	8	20	31	20	47	26	25														

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 2020. 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	10.1	4.1	75.5	59.6	17.1	NA	166.9	5	3.1	61.9	57.5	15	NA	151.2	17.1	5.2	89	61.7	19.2	NA	182.2
1971	14.3	3.6	43.2	34.8	13.5	0.7	110.4	7.1	2.6	35.5	32.6	11.9	0.6	98.2	24.1	4.6	51	37	15.1	0.7	123.4
1972	12.3	3.7	56.4	49.4	16	1.4	139.7	6.1	2.7	46.3	42.3	14.3	1.4	124.3	20.8	4.7	66.5	56.4	17.7	1.4	155.1
1973	17.1	4.6	62.4	47.7	12.9	1.4	146.6	8.5	3.5	51	40.6	11.7	1.4	129.3	29.2	5.8	73.4	54.7	14.1	1.4	164.6
1974	17.2	3.6	83.6	67.2	27.1	1.4	200.5	8.3	2.9	68.5	57.1	24.8	1.4	178.3	28.8	4.4	98.3	77.3	29.4	1.4	222.6
1975	15.9	5.2	70.9	43	28.8	2.3	166.9	7.8	3.9	58.1	36.6	26.3	2.3	148.7	26.7	6.5	83.7	49.4	31.5	2.4	184.9
1976	18.3	4.4	70.2	40.2	26.7	1.3	161.8	9	3.3	57.7	34.2	23.8	1.3	143	31	5.4	83.1	46.4	29.4	1.3	181.1
1977	16.2	3.5	82.8	80.6	32.3	2	218	8	2.9	68.2	69	28.9	2	195.4	27.4	4.2	98	92.1	35.7	2	241.1
1978	12.7	3.6	75	36.3	18.8	4.2	151.1	6.4	2.9	61.3	32.1	17.2	4.2	134.3	21.4	4.2	88.3	40.5	20.4	4.2	167.9
1979	7.2	1.7	41.2	12	10.5	1.9	75	3.6	1.3	33.8	10.6	9.4	1.9	65.8	12.2	2.1	48.6	13.4	11.6	2	84.1
1980	17.3	3.9	98	56.8	38.7	5.8	221.2	8.5	3.2	80.5	49.8	34.8	5.7	198.1	29.2	4.6	115.8	63.9	42.6	5.8	244.1
1981	15.7	7	76.9	24.3	23.2	5.6	153.3	7.7	5.5	63.2	20.4	20.8	5.6	135.3	26.3	8.6	91	28.4	25.7	5.7	171.7
1982	11.5	3.2	68.3	41.8	16.7	6.1	148.2	5.7	2.5	56	32.7	14.8	6	130.1	19.5	3.8	80.6	51	18.6	6.1	165.8
1983	8.3	3.7	56.2	31.3	16.5	2.2	118.4	4.1	3	46.1	25.7	14.5	2.1	105.2	14.1	4.4	66.2	36.8	18.5	2.2	132
1984	6	3.4	46.7	29.5	21.4	3.2	110.5	2.9	2.5	45.4	20.7	18.3	3.2	100	10.1	4.3	48	38.3	24.6	3.3	121
1985	4.8	2.7	48.7	36.1	29.7	5.5	127.8	2.3	1.9	47.1	25.3	25.4	5.5	115.4	7.9	3.6	50.3	46.7	34	5.6	139.9
1986	8.2	3.3	57.2	57.4	21.4	6.2	153.9	4	2.4	55.8	40.7	18.2	6.1	135.8	13.7	4.2	58.6	73.6	24.7	6.2	171.4
1987	11	2.4	53.8	35.7	13.7	3.1	120	5.4	1.7	52.4	25.8	11.6	3.1	107.5	18.5	3	55.2	45.8	15.7	3.1	132.5
1988	6.9	3.4	59.3	42.5	11.8	3.3	127.5	3.4	2.4	57.6	31.1	9.9	3.3	114.8	11.6	4.4	61	53.9	13.7	3.3	140.5
1989	6.7	1.7	54	28	14.6	3.2	108.4	3.2	1.2	52.6	20.5	12.4	3.2	99.4	11.2	2.1	55.4	35.7	16.9	3.2	117.7
1990	3.9	2.7	53.1	36.8	11.6	5.1	113.3	1.9	2	51.2	26.2	9.9	5	101.9	6.4	3.4	55.1	47.5	13.4	5.1	124.8
1991	1.9	2.1	48	35.9	13	2.6	103.6	0.9	1.6	46.2	24.6	11.1	2.6	91.9	3.1	2.5	49.7	46.9	14.9	2.7	115
1992	7.5	8.2	48	37.8	12	2.5	116.3	4	5.4	46.3	31.9	10.3	2.4	108	12.7	10.9	49.8	43.7	13.7	2.5	124.7
1993	9.5	4.4	37	43.3	8.1	2.2	105	6	3.2	36.2	23.2	7.2	2.2	84.1	15.2	5.5	37.7	63.3	9	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	13.1	4	37.4	30.2	5.2	1.3	91.8	8.6	2.9	36.7	24	4.7	1.3	83.2	20.6	5.2	38	36.5	5.7	1.4	101.5
1995	25.8	3.8	43.2	39.6	6.8	1.7	121.5	18.3	2.6	42.5	33.6	6	1.7	110.9	38.2	5.1	44	45.6	7.6	1.8	135
1996	18.5	5.7	39.2	29.3	9.2	2.4	104.7	13.3	4.1	38.4	23	8.1	2.4	95.7	27	7.3	40	35.5	10.3	2.4	115.1
1997	16.3	6	32.4	24	4.6	1.6	85.4	11.6	4.2	31.8	18.4	4.1	1.6	76.9	23.8	7.8	33.1	29.8	5	1.6	94.8
1998	8.8	6.5	24.8	16.3	2.6	1.5	60.5	5.2	4.5	24.2	12.8	2.4	1.5	54.9	12.4	8.4	25.4	19.9	2.8	1.5	66.3
1999	10.5	6.3	27.2	15.9	4.2	1.2	65.2	6.3	4.4	26.3	13.1	3.9	1.2	59.5	14.9	8.2	28	18.8	4.5	1.2	71
2000	14.4	6.4	25.9	17.1	2.4	0.5	66.7	8.6	4.5	24.8	14.1	2.2	0.5	59.6	20.4	8.2	27	20	2.6	0.5	73.9
2001	15.2	2.5	27.2	27	4.3	0.8	76.9	9	1.7	26.3	23.3	3.9	0.8	69.5	21.6	3.3	28.2	30.7	4.6	0.8	84.7
2002	11	2.4	19.3	14.1	1	0.5	48.3	6.5	1.6	18.6	11.5	0.9	0.5	42.8	15.8	3.3	20	16.6	1	0.5	54
2003	9.2	3.4	30.8	26	3.3	1.2	74	4.9	2.2	29.6	21.4	3	1.2	67.1	13.8	4.5	31.9	30.8	3.6	1.2	80.7
2004	11.2	3.3	26.7	25.5	2.7	1.3	70.8	7.5	2.1	25.8	20.3	2.5	1.3	63.9	15	4.6	27.6	30.7	2.9	1.3	77.5
2005	13.7	4.4	25.9	26.6	1.7	1	73.3	7.9	2.5	25	21.4	1.5	1	65	19.7	6.3	26.7	32	1.8	1	81.7
2006	13.8	5.3	24	22.8	2.5	1	69.6	8.7	3.6	23.3	18.4	2.3	1	62.3	19.1	7.2	24.7	27.4	2.8	1	77
2007	14.3	4.2	22	22.5	1.4	1	65.3	8.5	2.6	21.3	18.8	1.3	0.9	58	20.5	5.7	22.7	26.1	1.5	1	72.8
2008	17.1	3.9	26.5	18.8	3.1	1.8	71.1	10.4	2.4	25.4	14.7	2.7	1.7	62.7	24.1	5.3	27.6	23.1	3.4	1.8	79.7
2009	25.6	4.6	25.6	24.1	2.7	2.1	84.7	13.5	2.8	24.8	20	2.4	2.1	71.7	37.7	6.4	26.5	28.2	2.9	2.1	97.8
2010	12.2	4.7	27.6	20.3	2	1.1	67.8	7.5	3.1	26.8	16.3	1.8	1.1	61.1	17.1	6.2	28.4	24.3	2.2	1.1	74.5
2011	37.6	3.7	34.9	53.6	4.6	3	137.4	21.4	2.4	33.9	42.5	4.2	3	117.1	53.9	5	35.8	64.7	5.1	3.1	157.3
2012	21.9	2.3	24.5	19.6	1.1	0.9	70.3	13.3	1.6	23.7	16	1	0.9	60.8	30.7	3	25.3	23.2	1.2	0.9	80.1
2013	41.8	4.8	28.1	25.5	2.9	0.5	103.7	25.9	3.1	27.3	20.1	2.6	0.5	86.5	58.1	6.6	28.9	30.9	3.3	0.5	121.2
2014	40.4	2.9	16.2	17.3	0.7	0.3	77.8	24.9	1.9	15.7	13.6	0.6	0.3	61.8	56	3.8	16.6	21	0.8	0.3	93.9
2015	57.6	4.9	26.6	22.2	0.7	0.8	112.8	34.7	3.3	25.8	18	0.6	0.8	89.6	81.3	6.6	27.4	26.5	0.7	0.8	137.1
2016	47.1	4.4	28.7	27.8	1.5	0.4	109.9	25.6	2.9	27.7	21.7	1.4	0.4	87.4	69	5.9	29.6	33.8	1.7	0.4	132.9
2017	49.9	3.8	27.8	26.3	1.1	0.7	109.5	23.6	2.4	26.8	21.7	1	0.7	83	76.4	5.1	28.8	30.8	1.2	0.7	136.5
2018	29.9	2.2	20.9	31.5	1.4	0.5	86.3	16.5	1.3	20.2	24.4	1.3	0.5	71.1	44.1	3.1	21.5	38.5	1.6	0.5	102.5

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	5	22.3	17.2	0.7	1.1	64	9.2	2.6	21.6	12.9	0.6	1.1	53.9	26.4	7.4	23	21.5	0.8	1.1	74.3
2020	29.7	2.9	28.3	31.2	1.1	1.5	94.7	27.4	1.6	27.5	25.2	1	1.4	88.1	32.2	4.1	29.1	37.2	1.2	1.5	101.4
% Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years mean)																					
	69%	*	27%	*	*	28%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	8	39	31	23	45	26	30														

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	45.2	105.2	13.8	39.4	18.4	NA	222.9	30.1	89.7	11.3	30.3	14.7	NA	197.5	68.6	120.3	16.3	48.4	22.2	NA	251.7
1971	60.7	92.1	11.7	32.7	12.1	0	209.8	40.7	78.4	9.6	25.6	9.3	0	182.7	91.4	105.8	13.8	39.7	14.9	0	244
1972	45.7	86.4	10.3	40.3	10.8	0	194.1	31	73.2	8.4	31	7.9	0	169.8	68.8	99	12.1	49.4	13.7	0	222.3
1973	6.4	124.5	13.7	45.6	18.2	0	208.6	1.9	106.7	11.2	36.7	14.7	0	187.4	12.3	141.8	16.2	54.6	21.9	0	229.9
1974	51.2	94.2	12.6	76.1	33.1	0	268.7	35.1	80.6	10.3	61.5	26.7	0	239.3	77.3	107.9	14.8	90.8	39.5	0	301.7
1975	98.9	117.7	14.5	67	26.2	0.1	325.5	67.5	99.7	11.9	54.4	22.7	0.1	284.4	149.3	135.1	17.1	80	29.6	0.1	379.1
1976	67.7	123.9	16.2	90	40.7	0.2	340.8	45.4	104.4	13.3	72.2	34.4	0.1	301.8	103.1	143.5	19.1	108	47	0.2	384.2
1977	61	125.2	15	24.9	32	0.1	259.4	40.9	105.7	12.3	18.7	26.3	0.1	227.8	92.6	144.7	17.7	30.9	38	0.1	297.1
1978	30.3	110.6	14.3	22.8	9	0.1	188	20.1	93.1	11.7	18	7.7	0.1	165.6	45.5	128.2	16.9	27.6	10.3	0.1	211.1
1979	38.1	120.8	19.8	49.8	36.5	0.2	266.3	25.1	101.8	16.3	40.1	30	0.2	238.6	59	139.5	23.4	59.4	43.1	0.2	296.2
1980	92.5	136.3	26	43.4	49.7	0.7	350.1	62.6	116.4	21.3	35	41.8	0.7	309.1	139	156.5	30.7	52.1	57.6	0.7	401
1981	100.1	179	38.6	70	40.3	1	430.5	67.6	151	31.7	49.2	32	1	378.3	152	206.3	45.6	90.6	48.6	1	493
1982	68.9	158.7	21.1	89.6	24.4	0.3	365	46.4	135.6	17.3	64.3	19.7	0.3	319.9	104.7	182.3	24.9	114.2	29.2	0.3	413
1983	41.2	124.6	15.1	23.7	14.8	0.3	220.9	27.4	105.5	12.3	16.2	12.1	0.3	193.6	64	143.2	17.8	31.3	17.6	0.3	250.5
1984	21.1	167	20.8	22	32.7	0.5	264.7	13.8	140.1	19.8	12.4	26.6	0.5	233.7	32.6	193.9	21.9	31.4	38.9	0.5	295.9
1985	39.9	159.2	21.1	59.7	36.2	0.4	317.9	26.6	131.8	20	42.3	28.9	0.4	279.9	61.7	186.6	22.3	77.2	43.4	0.4	356.9
1986	62.1	162.8	28.2	121.8	39.4	0.7	417.6	41.7	137.5	26.7	88.4	31.9	0.7	366.1	94.3	188.2	29.6	156.5	47.1	0.7	470.3
1987	76.6	110.9	33.2	90.7	41.2	1.1	355.9	51.1	93.9	31.4	65.8	33.1	1.1	311.1	117.4	127.8	35	115.2	48.9	1.1	405.6
1988	70.4	177.8	36.8	127.8	42.1	0.9	457.2	46.6	149.7	35	92.7	34.3	0.9	402	108	204.9	38.6	163.2	49.9	0.9	517.4
1989	47	89.2	31.2	70.1	43.6	1.1	283.4	31.1	76.2	29.7	48.1	35.5	1.1	249.9	72.4	102	32.6	91.8	51.6	1.1	320.3
1990	27	122.2	33.3	84.7	43.9	0.6	312.5	17.5	107.8	31.8	60.9	35.2	0.6	279.9	42.1	136.6	34.8	109	52.9	0.6	346.5
1991	22	85.2	26.6	66.9	22.3	0.2	223.9	14.3	75.6	25.4	49.2	18.5	0.2	200.6	34.2	94.4	27.8	84.2	26	0.2	247.7
1992	31.5	205.3	27.8	160	26.3	1.1	453.5	21.3	176	26.4	131.9	21.7	1.1	408.6	48.5	234.2	29.2	188.1	31	1.1	497.7
1993	43.3	239.4	22.6	113.3	20.4	0.4	441	30.6	209.2	21.5	65.6	16.7	0.4	380.7	64.2	268.9	23.7	160.4	24.3	0.4	500.3

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
1994	30.9	129.7	21.2	45.3	9.1	0.4	237.8	22.3	107.1	20.3	35.6	8	0.4	211.1	45.6	151.8	22.2	54.9	10.2	0.4	265.3
1995	45.2	171.3	18	48.2	17.9	0.2	302	33.3	140.5	17.1	39.6	15.3	0.2	266.2	64.4	201.4	18.9	57	20.4	0.2	338.6
1996	87	275.1	23.2	35.3	28.3	0.7	451.8	65	230.6	22.3	28.8	24	0.6	399.1	124.3	318.4	24.2	41.8	32.5	0.7	507.3
1997	92.8	151.7	18.9	19.4	8.3	0.4	292.4	71.1	134.2	18	14.9	7.2	0.4	261.7	127.7	169.7	19.8	23.9	9.5	0.4	331.3
1998	148.4	158.3	21.7	26	19.9	0.4	375	100.2	146	20.6	21.4	18.3	0.4	324.9	197.4	170.7	22.7	30.5	21.6	0.4	425.8
1999	144.2	176.3	23.8	21.8	10.2	0.4	377.1	97.4	160.5	22.7	18.3	9.4	0.4	327.3	192.5	192.2	24.9	25.4	11	0.4	427.5
2000	178.4	204.7	21.4	31.7	12	0.3	448.2	120.2	192.8	19.6	26.8	11	0.3	389.2	236.4	216.5	23.3	36.5	13	0.3	508.1
2001	142.7	133.6	13.9	26.4	5.1	0.3	322.2	96.2	125.5	13.2	22.4	4.7	0.3	275.2	189.2	141.6	14.6	30.4	5.5	0.3	369
2002	100	132.8	21.4	44	9.5	0.4	308.1	64	120.7	20.5	36.8	8.7	0.4	269.6	136.4	145.1	22.3	51	10.4	0.5	347.6
2003	83.2	219.7	19.4	25.5	5.6	0.2	353.5	49.3	210	18.6	21.6	5.1	0.2	318.1	116.4	229.2	20.2	29.6	6.1	0.2	388.1
2004	92.8	188.4	26.3	49.3	8.1	0.3	365.1	69.9	170.2	24.6	40.9	7.4	0.3	334.5	115.3	206.6	28.1	57.5	8.9	0.3	395.8
2005	217.8	197.1	18.3	29.5	7.3	0.3	469.8	163.2	152.8	17.2	23.7	6.6	0.3	398.6	272.7	243.5	19.4	35.1	8	0.3	543.7
2006	211.3	190.7	21.6	37.8	10	0.5	471.6	137.6	172.3	20.4	30.3	9.1	0.4	395.5	283.6	209.8	22.7	45.3	11	0.5	547.6
2007	192.7	167.7	16.7	26.7	7.5	0.3	411.5	136.1	142.6	15.6	20.8	6.8	0.3	349.3	248.7	192.5	17.8	32.6	8.3	0.3	474.8
2008	201.5	217.3	26.9	40.9	15.1	0.8	503.6	146.5	192.5	25.5	30.8	13.6	0.8	440.8	256.5	243.1	28.3	51.1	16.6	0.8	565.8
2009	101.4	197.4	16.2	15.6	4.1	0.2	335	58.2	169.2	15.2	11.7	3.7	0.2	281.3	143.2	225.8	17.2	19.5	4.5	0.2	386.7
2010	119.6	235.2	21.4	47.4	14.8	0.5	439.3	80.9	223.8	20.1	40.2	13.3	0.5	397.5	159	246.7	22.8	54.5	16.3	0.5	480.7
2011	243.2	214	28.2	49.8	9.4	1.1	546.5	146.1	187	26.7	39.4	8.4	1.1	443.9	343.4	240.6	29.7	60.2	10.3	1.1	650.5
2012	173.4	246.7	17.8	11.5	0.6	0	449.6	111	226.5	16.7	8.5	0.5	0	384.1	233.6	266.9	18.8	14.5	0.6	0	514.1
2013	153.2	163.4	14.6	14.9	2.1	0.1	348.4	88.9	147.9	13.6	11.1	1.9	0.1	281.8	218	179	15.5	18.8	2.3	0.1	414.6
2014	264.1	146	16.8	8.7	1.4	0.1	437.7	183.2	130.7	15.8	7.1	1.3	0.1	355.5	348.1	161	17.8	10.5	1.5	0.1	522.2
2015	256.8	252.3	28.1	37.4	4.2	0.2	577.8	181.3	222.4	26.7	33.1	3.8	0.1	495.9	329.6	282.1	29.5	41.9	4.6	0.2	659
2016	202.7	177.7	26.3	23.1	2.5	0.2	431.9	117.6	153.8	24.8	18.5	2.3	0.2	343	288.3	201.3	27.8	27.7	2.8	0.2	522.4
2017	160	173.1	19.1	21.1	3.9	0.4	377.5	86.7	139.7	17.9	17.4	3.5	0.4	296.8	236.4	205.7	20.3	24.7	4.3	0.4	461.2
2018	284.8	113.6	18.1	17	1.3	0.3	435.4	178.8	97.8	17.1	14.1	1.2	0.3	328.9	392.2	129.6	19.2	19.9	1.4	0.3	544.2
2019	114.7	216.5	16.5	15.4	3.5	0.4	367.6	66.2	163.7	15.5	12.4	3.2	0.4	291.8	164	270.8	17.4	18.3	3.8	0.4	443.7

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
2020	196.6	179.9	21.1	25	3.1	0.2	425.6	136.7	151.3	20	21.3	2.8	0.2	358.9	255.3	207.8	22.2	28.7	3.4	0.2	492.4
Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years mean)																					
	71%	*	28%	*	*	-41%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	9	16	24	36	45	36	17														

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 2020. 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	9.6	12.7	39.1	11.9	7.9	NA	81.5	4.4	9.7	32.1	9.6	5.6	NA	71	16.6	15.8	46.3	14.2	10.2	NA	92.6
1971	13.8	11	20.3	11.8	8.2	0.5	65.6	6.6	8.5	16.6	9.4	6.4	0.5	55.9	23.6	13.5	23.9	14.2	9.9	0.5	76.9
1972	11.9	11.3	39.6	33.3	12	1	109.6	5.6	8.7	32.5	25.5	10.1	1	96	20.4	13.9	46.7	41.2	13.8	1	123.3
1973	16.1	15.4	40.5	35.4	7.6	1.1	116.7	7.5	11.9	33.1	27.8	6.3	1.1	101.3	28.2	18.9	47.6	43	9	1.1	133
1974	16.4	13.1	48.9	55.9	15.2	1.1	151.2	7.5	11.5	40.1	44.5	12.9	1.1	132.4	28	14.6	57.8	67.2	17.5	1.2	170
1975	15.6	17.2	40.8	33.8	17.9	1.9	127.5	7.5	14.9	33.4	26.4	15.3	1.9	112.6	26.4	19.4	48.1	41	20.5	2	143
1976	17.5	15.6	38.8	29.2	16.9	1.1	119.5	8.1	13.6	31.8	22.1	14.1	1.1	104.5	30.1	17.6	45.8	36.1	19.8	1.1	136
1977	14.9	11.8	55.7	55.7	21.5	0.6	160.9	6.7	10.2	45.8	43.1	18.1	0.6	141.6	26.1	13.5	65.9	68	25	0.6	181.1
1978	12	9.8	51.3	19.4	10.9	3.3	106.9	5.6	8.8	41.9	14.6	9.2	3.3	93.7	20.6	10.8	60.4	24.2	12.6	3.3	120.7
1979	6.6	6.6	21.9	8.8	7.9	1.5	53.5	3	5.7	18	6.7	6.7	1.5	47	11.6	7.5	25.8	10.9	9.2	1.5	60.6
1980	16.4	10.1	60.8	34.4	23.9	4.3	150.5	7.6	9.2	49.9	26.8	19.8	4.2	132.5	28.3	11.1	71.9	42	28.1	4.3	168.9
1981	15.2	27.5	44.8	16	12.7	4.3	120.8	7.2	23.9	36.7	9.7	10	4.3	105.9	25.8	31	52.8	22.2	15.5	4.4	136.4
1982	10.9	10.4	45.5	26.9	10.4	4.6	109.2	5.1	8.9	37.2	15.8	8.3	4.6	92.5	18.9	11.9	53.6	38.3	12.5	4.7	125.8
1983	7.9	11.1	29.7	17.9	5.7	1.8	74.4	3.7	9.9	24.3	11.2	3.6	1.8	63.8	13.6	12.3	35	24.9	8	1.8	85.4
1984	5.5	11.9	37.7	28.5	20.1	2.5	106.4	2.4	8.7	35.9	19.2	16.6	2.5	94.6	9.6	15.1	39.5	37.9	23.3	2.6	117.8
1985	4.5	10.9	36.5	43.2	28.6	4.9	128.7	2	7.6	34.4	30.6	23.7	4.8	114.1	7.6	14.2	38.7	55.9	33.4	4.9	143.3
1986	7.7	12.2	41.1	66.9	24.8	5.6	158.6	3.6	9.4	39.2	47.4	20.4	5.5	137.4	13.3	15.1	43	85.8	29.3	5.6	179.4
1987	10.4	8.4	36.5	44	16.1	2.8	118.6	4.8	6.5	34.6	31.2	13.4	2.8	103.3	17.9	10.4	38.5	56.4	18.7	2.8	133.5
1988	6.2	13	43.7	51.8	14.8	3	132.7	2.7	9.9	41.3	37.7	12.1	3	117.1	10.9	16.1	46.1	65.9	17.5	3.1	148.4
1989	6.2	6.9	41.7	40.6	18.1	2.8	116.4	2.8	5.4	39.8	29.7	15.2	2.8	104.1	10.7	8.4	43.6	51.7	21	2.8	129.3
1990	3.5	10.2	41.5	54.9	15.2	4.4	129.7	1.5	8.3	38.9	37.9	12.8	4.3	112.2	6.1	12.1	44.2	71.6	17.7	4.4	147.4
1991	1.8	7.5	33.6	56.2	14.1	2.4	115.7	0.8	6.1	31.3	38.2	11.9	2.4	97.3	3	9	36	73.8	16.3	2.4	133.8
1992	6.7	31.4	33	58.1	13	2.3	144.8	3.2	22.1	30.6	49.4	11	2.3	130.8	12	40.7	35.3	66.7	15	2.3	159
1993	9.1	17	25.5	63	8.7	2.1	125.8	5.6	13.6	24.5	33.6	7.6	2	95.8	14.8	20.3	26.5	92.2	9.9	2.1	155.4

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
1994	12.7	16.8	25	40.3	5.4	1.3	102.2	8.1	13.3	24.1	32	4.8	1.3	91.1	20.1	20.5	26	48.5	6.1	1.4	113.6
1995	25.4	18.5	34.9	47.5	7.1	1.7	135.7	17.9	14.3	33.8	40.4	6.2	1.7	123.6	37.7	22.9	35.9	54.5	8	1.8	150.1
1996	18.2	28.4	30.2	39.5	9.9	2.4	129.2	12.9	23.3	29.2	31.6	8.7	2.4	117.6	26.6	33.5	31.3	47.5	11.2	2.4	141.3
1997	16.1	27.6	25.1	34.4	4.9	1.6	110.2	11.4	22.4	24.2	26.9	4.3	1.6	99.3	23.6	32.6	25.9	42	5.5	1.6	121.4
1998	13.2	34.9	23.2	29.3	3.5	1.5	105.4	7.6	27	22.4	24	3.2	1.5	94.1	18.5	42.7	23.9	34.7	3.8	1.5	116.7
1999	15.6	31.8	28.1	25.9	4.4	1.2	107.1	9.2	24.7	26.9	21.7	4.1	1.2	96	22.2	39	29.4	30.2	4.8	1.2	118.1
2000	21.7	26.5	26.8	29.2	2.7	1.6	108.4	12.7	22.5	25.3	24.6	2.4	1.6	97.2	30.5	30.5	28.3	33.7	2.9	1.6	119.6
2001	22.8	17.5	28	38.6	4.4	1.5	112.5	13.4	14.8	26.7	33.5	4	1.5	101.6	32.1	20.2	29.3	43.4	4.8	1.5	123.9
2002	16.5	16.6	20.7	22.5	1.4	0.5	78.2	9.6	13.4	19.8	18.9	1.2	0.5	69.5	23.7	19.6	21.7	26.2	1.5	0.5	87
2003	13.8	24.1	33.8	38.7	3.3	1.2	114.8	7.1	19	32.2	32.4	3	1.2	104	20.5	29.1	35.4	44.9	3.6	1.2	125.7
2004	16.7	21.8	28.4	38.1	3	1.3	109.3	11.2	16.7	27.2	31.1	2.7	1.3	98.5	22.1	27	29.7	45.2	3.2	1.3	119.9
2005	20.6	27.9	28.2	36.8	1.9	1.1	116.4	11.7	20	27	29.8	1.7	1.1	102.1	29.3	35.8	29.3	43.9	2.1	1.1	130.5
2006	20.8	35.4	26.2	36.6	2.8	1.4	123.2	12.9	29.5	25.2	30	2.5	1.4	111.1	28.6	41.1	27.2	43.2	3.1	1.4	135.1
2007	21.6	29.3	23.7	33.4	1.5	1.2	110.6	12.6	23.1	22.7	28.1	1.3	1.2	98.1	30.5	35.4	24.6	38.6	1.6	1.2	123
2008	25.8	28.3	30.1	27.4	3.2	2.2	117	15.5	21.9	28.7	21.8	2.8	2.2	103.2	36	34.7	31.6	33	3.5	2.3	130.8
2009	39.1	34.1	28.8	34.9	3	2.3	142	20.4	23.7	27.6	29.2	2.7	2.3	119.2	57.6	44.7	30	40.6	3.3	2.3	164.6
2010	18.5	34.7	32	31.3	2.4	1.5	120.5	11.3	28.1	30.9	26	2.1	1.5	108.9	25.7	41.5	33.1	36.9	2.6	1.5	131.9
2011	57.7	42.6	39.7	65.4	4.7	3.9	213.8	32.8	30.7	38.3	52.4	4.2	3.9	181.8	82.2	55	41	78.4	5.2	3.9	245
2012	33.7	28.5	27.5	26.5	1.2	2.1	119.6	20.3	23	26.4	21.7	1.1	2	104.1	46.9	34.1	28.6	31.6	1.4	2.1	134.9
2013	64.1	37.4	31.8	34.4	3.1	5.3	176.2	39.4	25.5	30.7	27.2	2.8	5.2	147.3	88.4	49.1	33	41.7	3.5	5.3	204.9
2014	62.3	19.9	17.4	22.5	0.7	0.6	123.2	38.3	16.1	16.8	17.8	0.7	0.6	98.7	85.2	23.7	18	27.1	0.8	0.6	146.9
2015	88.6	36.3	30.9	32.5	0.7	1.5	190.5	53.4	28.6	29.8	26.7	0.7	1.5	153.9	123.8	44	31.9	38.3	0.8	1.5	227.3
2016	72.3	31.4	33.3	36.7	1.5	0.9	175.9	39.5	24.1	32	29.1	1.4	0.9	141.4	104.8	38.5	34.7	44.4	1.7	0.9	210.9
2017	76.8	21.7	32.9	33.7	1.2	1.5	167.8	36.2	16.4	31.6	28.2	1.1	1.4	126.9	116.4	27.1	34.2	39.2	1.3	1.5	207.8
2018	46	10.9	24.4	37.8	1.5	0.9	121.7	25.3	8.2	23.5	29.8	1.3	0.9	99.1	67	13.8	25.3	45.9	1.7	0.9	144.5

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	26.9	30.1	26.3	22.1	0.7	1.2	107.5	13.9	20.6	25.4	16.9	0.7	1.2	90	40.2	40.1	27.3	27.2	0.8	1.2	125.1
2020	45.6	25.1	34.4	41.4	1.1	1.5	149.2	44.1	19.1	33.4	34	1	1.5	139.5	47.1	31	35.5	48.7	1.3	1.5	158.8
Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years mean)																					
	70%	*	31%	*	*	20%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	8	20	20	13	47	31	10														

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 2020. 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	9.6	3.2	28.5	10	6.5	NA	58.1	4.4	2.3	23.4	8.2	4.7	NA	49.5	16.6	4.2	33.8	11.8	8.3	NA	67.6
1971	13.8	3	14.8	10.5	7.1	0.5	49.6	6.6	2.1	12.1	8.3	5.6	0.5	41.1	23.6	3.9	17.4	12.5	8.5	0.5	60.2
1972	11.9	3.1	28.9	29.2	10.4	1	84.9	5.6	2.2	23.7	22.4	8.7	1	73.2	20.4	4.1	34.1	36.1	12	1	97.4
1973	16.1	3.9	29.5	32.1	6.7	1.1	89.9	7.5	2.8	24.2	25.3	5.5	1.1	76.5	28.2	4.9	34.8	39.2	7.9	1.1	104.9
1974	16.4	3.1	35.7	49.1	14.1	1.1	120	7.5	2.4	29.3	39	11.9	1.1	103.5	28	3.8	42.2	59.1	16.2	1.2	136.7
1975	15.6	4.7	29.8	28.8	16.4	1.9	97.6	7.5	3.4	24.4	22.7	13.9	1.9	84.7	26.4	6	35.1	35.3	18.8	2	111.9
1976	17.5	4	28.3	24.2	15.5	1.1	90.7	8.1	3	23.2	18.3	12.9	1.1	77.4	30.1	5	33.4	29.9	18.1	1.1	106.1
1977	14.9	2.8	40.7	51.7	18.8	0.6	130.1	6.7	2.2	33.5	40.2	15.7	0.6	112.4	26.1	3.4	48.1	62.8	22	0.6	147.8
1978	12	3	37.4	15.9	9.4	3.3	81.3	5.6	2.5	30.6	12	7.9	3.3	70.2	20.6	3.6	44.1	19.8	10.9	3.3	93.1
1979	6.6	1.6	16	5.8	6.7	1.5	38.3	3	1.2	13.1	4.4	5.6	1.5	32.9	11.6	2	18.9	7.1	7.7	1.5	44.4
1980	16.4	3.3	44.3	31.4	21.3	4.3	121.5	7.6	2.6	36.5	24.6	17.7	4.2	106	28.3	3.9	52.5	38.4	24.8	4.3	137.9
1981	15.2	6.6	32.7	9.8	10.4	4.3	79.2	7.2	5.1	26.8	5.9	8.2	4.3	67.4	25.8	8.1	38.5	13.6	12.5	4.4	92.2
1982	10.9	2.8	33.2	21.2	7.8	4.6	80.8	5.1	2.2	27.1	12.1	6.2	4.6	67.7	18.9	3.4	39.1	30.3	9.4	4.7	94.8
1983	7.9	3.3	21.7	14	4.2	1.8	53	3.7	2.6	17.7	8.5	2.6	1.8	44.2	13.6	3.9	25.5	19.4	5.8	1.8	62.3
1984	5.5	3.2	27.5	25.9	17.5	2.5	82.4	2.4	2.3	26.2	17.3	14.5	2.5	72	9.6	4.1	28.8	34.8	20.5	2.6	92.8
1985	4.5	2.7	26.7	35.3	24.6	4.9	98.8	2	1.9	25.1	24.3	20.5	4.8	86.2	7.6	3.6	28.2	45.8	28.7	4.9	110.8
1986	7.7	3.2	30	55.5	18.4	5.6	120.8	3.6	2.3	28.6	38.9	15.3	5.5	102.8	13.3	4.1	31.4	71.8	21.6	5.6	138.4
1987	10.4	2.3	26.7	33.8	12.2	2.8	88.5	4.8	1.6	25.3	23.9	10.2	2.8	76	17.9	3	28.1	43.8	14.2	2.8	101.4
1988	6.2	3.4	31.9	41.1	10.4	3	96.3	2.7	2.4	30.2	29.8	8.5	3	83.9	10.9	4.4	33.6	52.8	12.2	3.1	109.1
1989	6.2	1.7	30.4	26.9	14.3	2.8	82.5	2.8	1.2	29	19.3	12.1	2.8	73.4	10.7	2.1	31.8	34.2	16.5	2.8	91.5
1990	3.5	2.7	30.3	35.5	11	4.4	87.5	1.5	2	28.4	25.1	9.3	4.3	76.3	6.1	3.4	32.3	46.4	12.7	4.4	99.1
1991	1.8	2	24.5	34.7	11.6	2.4	77.2	0.8	1.6	22.8	23.8	9.8	2.4	66	3	2.5	26.3	45.9	13.5	2.4	88.8
1992	6.7	8.1	24.1	36.7	10.8	2.3	88.9	3.2	5.4	22.3	30.8	9.2	2.3	80.8	12	10.8	25.8	42.6	12.5	2.3	97.4
1993	9.1	4.3	18.6	42.6	6.9	2.1	84.1	5.6	3.2	17.9	22.6	6.1	2	63.2	14.8	5.4	19.3	62.9	7.8	2.1	104.8

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
1994	12.7	3.9	18.3	29.6	4.4	1.3	70.5	8.1	2.8	17.6	23.3	3.9	1.3	62.1	20.1	5	19	35.8	4.9	1.4	80
1995	25.4	3.7	25.4	39	6.5	1.7	102.1	17.9	2.5	24.7	33.1	5.6	1.7	92	37.7	4.9	26.2	44.9	7.3	1.8	115.4
1996	18.2	5.5	22.1	28.4	8.4	2.4	85.3	12.9	3.9	21.3	22.3	7.3	2.4	76.5	26.6	7.1	22.8	34.6	9.5	2.4	95.6
1997	16.1	5.9	18.3	23.2	4	1.6	69.5	11.4	4.1	17.7	17.5	3.5	1.6	61.2	23.6	7.7	18.9	28.9	4.4	1.6	78.7
1998	8.6	6.4	16.9	15.9	2.3	1.5	51.6	5	4.4	16.3	12.3	2.1	1.5	45.9	12.2	8.3	17.5	19.4	2.5	1.5	57.1
1999	10.2	6.2	20.5	15.2	3.7	1.2	57	6	4.3	19.7	12.3	3.5	1.2	51.4	14.7	8.1	21.4	18	4	1.2	62.8
2000	14.2	6.2	19.6	16.5	2.2	1.6	60.2	8.3	4.4	18.5	13.5	2	1.6	53.1	20.1	8	20.7	19.5	2.4	1.6	67.4
2001	14.9	2.4	20.5	26	4	1.5	69.3	8.7	1.6	19.5	22.4	3.7	1.5	61.9	21.3	3.2	21.4	29.7	4.4	1.5	77
2002	10.8	2.4	15.1	13.5	0.8	0.5	43.1	6.3	1.6	14.4	11	0.7	0.5	37.7	15.6	3.2	15.8	16	0.9	0.5	48.8
2003	9	3.3	24.7	25.3	3.1	1.2	66.6	4.6	2.2	23.5	20.6	2.8	1.2	59.9	13.6	4.5	25.9	29.9	3.4	1.2	73.4
2004	10.9	3.3	20.7	24.7	2.6	1.3	63.4	7.3	2	19.8	19.5	2.4	1.3	56.8	14.7	4.4	21.7	29.8	2.8	1.3	70.2
2005	13.4	4.3	20.6	25.7	1.6	1.1	66.8	7.6	2.5	19.7	20.5	1.4	1.1	58.6	19.4	6.2	21.4	30.9	1.7	1.1	75
2006	13.6	5.3	19.1	22	2.4	1.4	63.9	8.4	3.5	18.4	17.6	2.1	1.4	56.5	18.9	7.1	19.9	26.5	2.6	1.4	71.2
2007	14.1	4.1	17.3	21.6	1.3	1.2	59.5	8.2	2.6	16.6	18	1.2	1.2	52.2	20.2	5.6	18	25.3	1.4	1.2	66.9
2008	16.8	3.8	22	18	3	2.8	66.4	10.1	2.4	20.9	13.9	2.6	2.8	58.1	23.9	5.1	23.1	22.2	3.3	2.8	75
2009	25.3	4.5	21	23.2	2.5	2.3	78.9	13.2	2.7	20.1	19.2	2.3	2.3	65.9	37.5	6.4	21.9	27.3	2.8	2.3	92.2
2010	12	4.6	23.3	19.5	1.9	1.5	62.7	7.3	3.1	22.5	15.5	1.7	1.5	56.1	16.9	6.1	24.1	23.4	2.1	1.5	69.4
2011	37.5	3.6	29	52.1	4.6	3.9	130.5	21.2	2.3	28	41.3	4.1	3.8	110.4	53.8	4.9	30	63.4	5	3.9	151.1
2012	21.8	2.3	20	18.9	1	2	66.2	13.2	1.6	19.2	15.4	0.9	2	56.6	30.7	3	20.9	22.6	1.1	2	75.9
2013	41.6	4.7	23.2	24.5	2.9	5.2	102.2	25.7	3	22.4	19.2	2.6	5.2	85	57.9	6.5	24.1	29.8	3.3	5.3	119.7
2014	40.3	2.8	12.7	16.6	0.7	0.6	73.6	24.8	1.9	12.2	13	0.6	0.6	57.7	55.8	3.8	13.1	20.2	0.7	0.6	89.6
2015	57.5	4.8	22.5	21.4	0.7	1.5	108.5	34.6	3.2	21.8	17.3	0.6	1.5	85	81.2	6.4	23.3	25.6	0.7	1.5	132.7
2016	46.9	4.3	24.3	26.8	1.5	0.9	104.4	25.4	2.8	23.4	20.9	1.3	0.9	82.3	68.8	5.8	25.3	32.6	1.6	0.9	127.5
2017	49.7	3.6	24	25.2	1.1	1.4	105.1	23.5	2.3	23.1	20.9	1	1.4	78.6	76.2	5	25	29.6	1.2	1.5	132.1
2018	29.8	2.2	17.8	30.4	1.4	0.9	82.4	16.5	1.2	17.1	23.5	1.3	0.9	67.2	44	3.1	18.5	37.4	1.6	0.9	98.8
2019	17.5	4.9	19.2	16.5	0.7	1.2	60	9	2.5	18.5	12.2	0.6	1.2	50.1	26.2	7.3	19.9	20.8	0.7	1.2	70.4

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
2020	29.6	2.8	25.1	30.1	1.1	1.5	90.2	27.3	1.6	24.4	24.3	1	1.4	83.8	32	4	25.9	36	1.2	1.5	96.7
Change [(2020–2019)/2019] (*values not shown as 2020 values are previous years' mean)																					
	70%	*	31%	*	*	18%	*														
Rank (highest = 1 to lowest) over 50 years (1971 to 2020)																					
	8	38	20	16	45	31	15														
2SW CL																					
	34.7	4.0	32.1	18.7	24.7	29.2															
% 2SW CL attained in most recent year (2020) (*values shown are based on the previous years' mean)																					
	85%	70*	78%	161%*	4*	5%															
2SW management objective																					
					11.0	4.5															
% 2SW management objective attained in most recent year (2020) (*values shown are based on the previous years' mean)																					
					10%*	32%															

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 2020. 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
2020	498	57	40	70	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 2019 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.

	USA	**Scotia-Fundy**				**Gulf**				**Québec**				**Newfoundland**						
Smolt year	Narraguagus	Nashwaak	La Have	St Mary's	Middle	Margaree	NW Miramichi	SW Miramcihi	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

	USA	Scotia-Fundy				Gulf				Québec				Newfoundland						
Smolt year	Narraguagus	Nashwaak	La Have	St Mary's	Middle	Margaree	NW Miramichi	SW Miramichi	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

	USA	**Scotia-Fundy**				**Gulf**				**Québec**				**Newfoundland**						
Smolt year	Narraguagus	Nashwaak	La Have	St Mary's	Middle	Margaree	NW Miramichi	SW Miramcihi	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
2019	0.3										1.4		0.8		0.6	13.7		7.2	0.9	5.6

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 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.

	USA	Scotia-Fundy				Gulf				Québec				Nfld
Smolt year	Narraguagus	Nashwaak	LaHave	St Mary's	Middle	Margaree	NW Miramichi	SW Miramcihi	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	St Mary's	Middle	Margaree	NW Miramichi	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	

	USA	Scotia-Fundy				Gulf				Québec				Nfld
Smolt year	Narraguagus	Nashwaak	LaHave	St Mary's	Middle	Margaree	NW Miramichi	SW Miramchi	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	
2018	2.6										2.0		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 2019 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for Newfoundland.

	USA			Scotia-Fundy				Gulf	Québec			
SMOLT YEAR	Connecticut	Penobscot	Merrimack	Saint John	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
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

	USA			Scotia-Fundy				Gulf	Québec			
SMOLT YEAR	Connecticut	Penobscot	Merrimack	Saint John	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
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								

	USA			Scotia-Fundy				Gulf	Québec			
SMOLT YEAR	Connecticut	Penobscot	Merrimack	Saint John	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
2016		0.05		0.54								
2017		0.05		0.25								
2018		0.05		0.15								
2019				0.67								

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 2018 smolt migration years. The year 1991 was selected for illustration as it is the first year of the commercial fishery moratorium for Newfoundland.

	USA			Scotia Fundy				Gulf	Québec			
SMOLT YEAR	Connecticut	Penobscot	Merrimack	Saint John	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
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							

	USA			Scotia Fundy				Gulf	Québec			
SMOLT YEAR	Connecticut	Penobscot	Merrimack	Saint John	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
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	La Have	East Sheet	Liscomb	Morell	Mill	West	Valleyfield	Aux Rochers
2016		0.08		0.00								
2017		0.16		0.00								
2018		0.22		0.06								

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 (PFA1SWnmat) 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 2020.

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	1239.1	702.6	535.7	1171.7	639.6	501.1	1310.4	766.5	576.5
1972	1256.5	723.6	532.3	1200.8	669.6	503	1318.9	781.7	565.6
1973	1568.5	901.5	667.2	1487.5	821.4	636.5	1652.9	984.4	698.3
1974	1511.7	811.8	699	1445.7	751.1	662.7	1582.4	876.9	739
1975	1704.5	904.7	798.3	1625.1	838.2	746.3	1789.5	973.8	861.4
1976	1634	835.2	797.8	1556.1	766.3	750.7	1719	910.1	849.5
1977	1305	667	636.5	1237.5	606.4	594.8	1376.1	729.2	682.6
1978	807.3	396.4	410.4	770.6	368.5	382.7	845.5	426.4	439.6
1979	1427.1	837	589.7	1356.9	771.6	557.3	1503.7	906.3	622.9
1980	1545.2	710.8	833	1476.1	655.8	781.1	1620.1	770.6	892.6
1981	1579	666.7	911.3	1505.5	621.5	849.9	1657.1	715.1	982
1982	1326.3	560.3	765.3	1266.5	523.6	715.4	1389.8	600	819.5
1983	845.6	334.6	510.5	805.8	305.6	479.4	889.8	366.3	545.3
1984	892.5	353.4	538.7	848.1	322.5	506	940.7	387.5	572.4
1985	1184.4	526.6	657.8	1126.6	483.9	617.4	1246.6	572.4	700.9
1986	1393.2	559.4	834.2	1323	512	777.2	1465.7	608.7	891.5
1987	1310	509.1	800.5	1252	473.2	750	1373.4	547.5	857.4
1988	1263.5	414.8	847.9	1195.8	382.6	788.7	1334.6	448.6	912.3
1989	920.9	326.5	594.2	876.2	299.5	556.3	969.9	357.1	633.7
1990	851.2	290.1	561.3	808.5	265.8	525.3	895.8	316.8	595.9
1991	738.1	321.9	415.9	704.3	300.2	390.8	772.7	346	441.2
1992	787.6	210.6	576.6	730	178.7	531	845.9	245.2	622.5

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	696	150.3	545	630.8	133.7	483.4	762.1	170.1	607.4
1994	514	185.8	327.8	477.6	164.4	300.1	552.6	210.9	356.1
1995	563.6	182.1	381.9	522.4	163.9	345.1	607.4	202.5	418.5
1996	711.1	155	555.7	652.3	139.1	501	773.5	173	614.6
1997	469.3	106.8	362.1	434.3	96.2	330	511.4	118.6	402.8
1998	540.1	98.3	441.3	485.9	87.5	389.3	594.2	110.5	493.5
1999	545.6	103.7	441.6	491.3	91.2	389.9	600.7	117.3	494.1
2000	642.1	117.7	523.6	576.9	104.1	461.7	705.1	132.9	584.5
2001	466.7	81.2	385.4	416.4	71.7	336.4	517.6	91.9	434.1
2002	495.5	110.5	384.8	451.1	97.6	344	539.9	124.4	426.1
2003	528.2	107.8	420.2	488.1	95.4	383.5	568	121.8	456.3
2004	559	112	446.8	522.4	98	414	596.8	127.9	479.9
2005	654.4	107.3	546.9	576.9	94.3	471.3	732	121.6	622.8
2006	652	101.5	549.9	571.4	89	471.4	731.6	115.7	627.9
2007	586.2	113.6	472.4	519.3	99	408	653.5	129.4	536.6
2008	728.9	132.9	596	659.4	112.5	530.4	800.7	155.7	661.5
2009	505.8	108.8	396.7	448	96.3	340.8	561.4	122.4	451.1
2010	742.3	209.6	532.2	684.4	177.8	488.2	800.5	244.5	576.3
2011	755.1	112.7	642.3	648.7	97.5	537.3	867.8	130.3	752
2012	676.4	163.3	513.2	602.2	136.2	445.6	751.7	193	579.5
2013	535.3	127	408.5	460.7	103.2	339.9	612	152.9	478
2014	679.6	180.1	499.3	582.9	145.7	412.9	779.1	219.6	586
2015	827.3	175.6	651.3	734.2	142.7	567.1	919.8	212.4	732.4
2016	663	167.5	496.2	560.2	128.4	404.7	767.5	208.6	589.2

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	560.2	132.6	426	470.4	109.6	341.8	650	159.4	512.2
2018	585.1	109.4	474.5	473.4	93.7	364.7	697.7	126.9	586.1
2019	562.4	148.1	413.8	482.2	133.3	335.7	642.7	164.5	492.2
2020	NA	NA	478.3	NA	NA	408	NA	NA	546.3
Prev. 5-year mean	639.6	146.7	491.4						
Change (recent year relative to previous year) (*values not shown for 2020 as some inputs to derive PFA are based on previous years mean)									
	*	*	*						
Change (recent year relative to previous 5-year mean)									
	-12%	1%	-3%						
Rank (highest = 1 to lowest) over time-series (1971 to most recent year)									
	38 / 49	32 / 49	41 / 50						

Table 4.4.2.1. Probabilities that the returns of 2SW salmon to the six regions of NAC will meet or exceed the 2SW objectives for the six regions in NAC and simultaneously for all regions in the absence of fishing on the 1SW non-maturing and 2SW age groups for the 2SW salmon return years 2021 to 2024. For the 2021 return year, catches of 1SW non-maturing salmon in 2020 in Labrador and at Greenland have already occurred and are accounted for in the estimation of the probabilities of meeting the 2SW objectives for the 2021 return year.

Region	2SW Objective to NAC	Probability of meeting 2SW objectives in the absence of fisheries (2SW return year)			
		2021	2022	2023	2024
Labrador	34 746	0.645	0.632	0.573	0.671
Newfoundland	4 022	0.465	0.401	0.268	0.300
Québec	32 085	0.534	0.413	0.419	0.464
Gulf	18 737	0.890	0.870	0.799	0.831
Scotia-Fundy	10 976	0.013	0.030	0.026	0.029
USA	4 549	0.094	0.144	0.213	0.226
Simultaneous to North America		0.004	0.006	0.006	0.007

Table 4.4.3.1. Predicted abundance (5th percentile upper table, 25th percentile middle table; median value lower table) of the 1SW non-maturing salmon at the PFA stage by region of North America for the 2021 to 2023 PFA years relative to the management objectives for the regions. The management objectives are adjusted for natural mortality for the eleven months between the PFA stage and returns to homewaters in North America. For North America, the objective shown is the sum of the 2SW conservation limits to all six regions (corrected for M by 11 months).

Region	Objective (corrected for M)	5th percentile of regional PFA		
		2021	2022	2023
Labrador	48 331	25 503	21 208	15 999
Newfoundland	5594	2 021	1 480	930
Québec	44 629	24 840	18 299	16 279
Gulf	26 063	22 029	19 569	14 630
Scotia-Fundy	15 267	672	541	328
USA	6328	474	349	345
North America	199 596	111 695	100 800	84 987

Region	Objective (corrected for M)	25th percentile of regional PFA		
		2021	2022	2023
Labrador	48 331	48 615	45 870	39 390
Newfoundland	5594	3 693	3 066	2 129
Québec	44 629	37 413	30 500	28 738
Gulf	26 063	40 465	39 688	32 868
Scotia-Fundy	15 267	1 437	1 312	932
USA	6328	1 143	1 040	1 188
North America	199 596	165 575	155 575	141 900

Region	Objective (corrected for M)	median of regional PFA		
		2021	2022	2023
Labrador	48 331	76 465	77 150	70 755
Newfoundland	5594	5 662	5 022	3 604
Québec	44 629	49 930	42 695	42 400
Gulf	26 063	61 335	62 905	58 470
Scotia-Fundy	15 267	2 415	2 525	1 890
USA	6328	2 072	2 130	2 607
North America	199 596	215 750	217 000	208 150

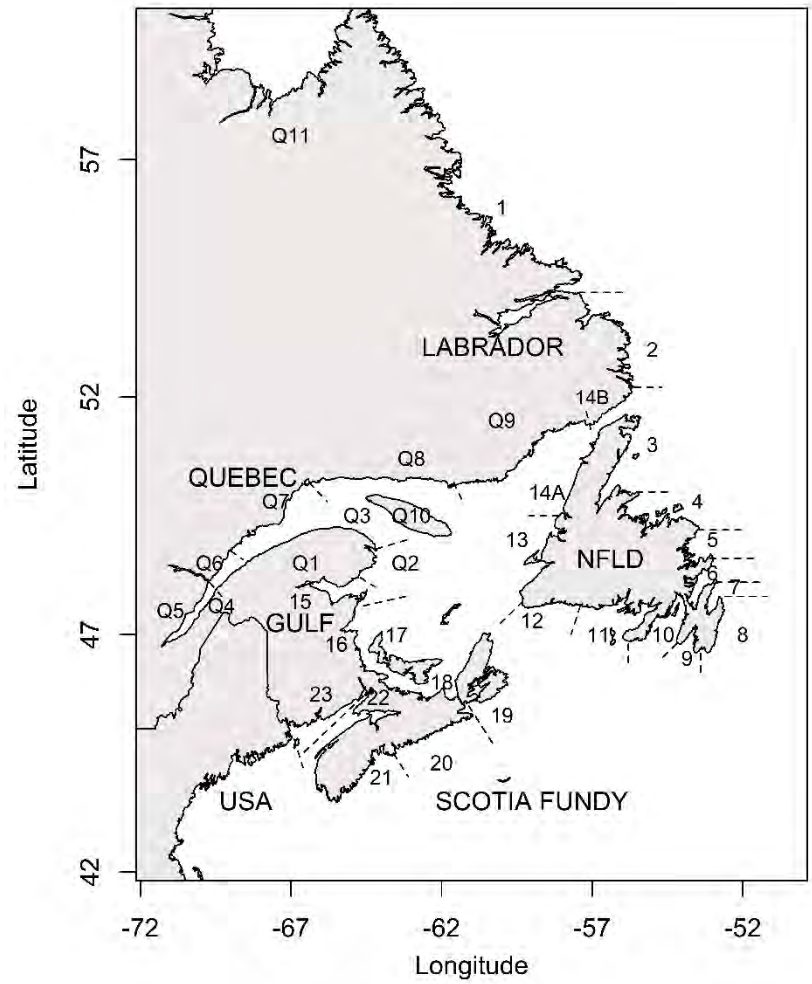


Figure 4.1.2.1. Map of Salmon Fishing Areas (SFAs) and Québec Management Zones (Qs) in Canada.

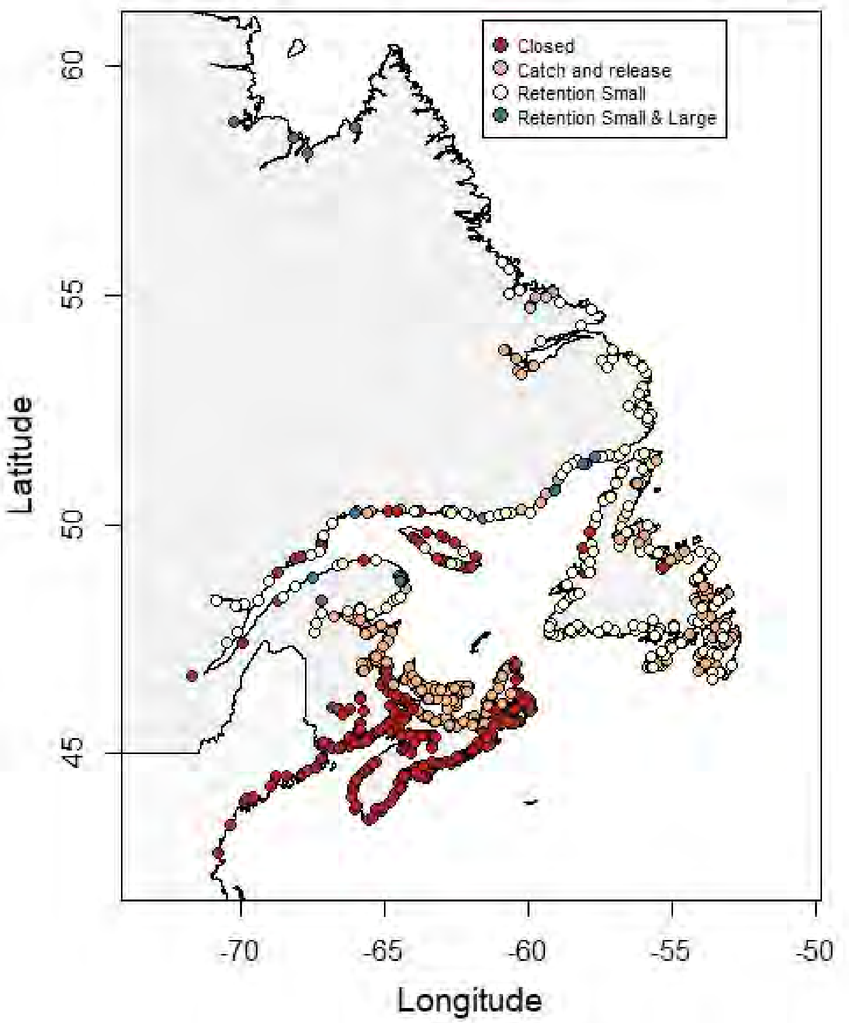


Figure 4.1.2.2. Summary of recreational fisheries management measures in Canada in 2020. Note: details on specific regions are available in the text and may not appear on the figure.

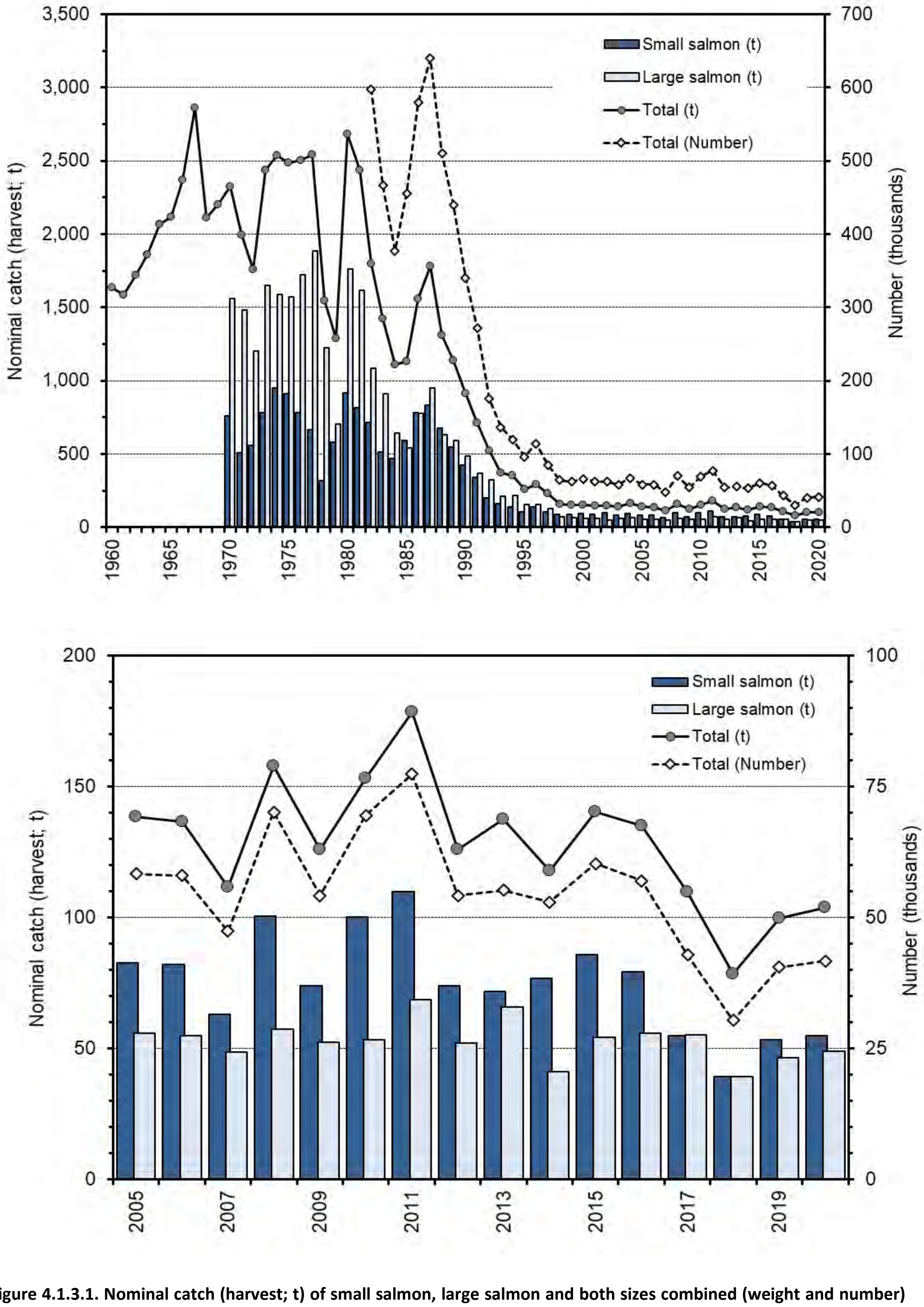


Figure 4.1.3.1. Nominal catch (harvest; t) of small salmon, large salmon and both sizes combined (weight and number) for Canada, 1960 to 2020 (top panel) and 2004 to 2020 (bottom panel) by all users.

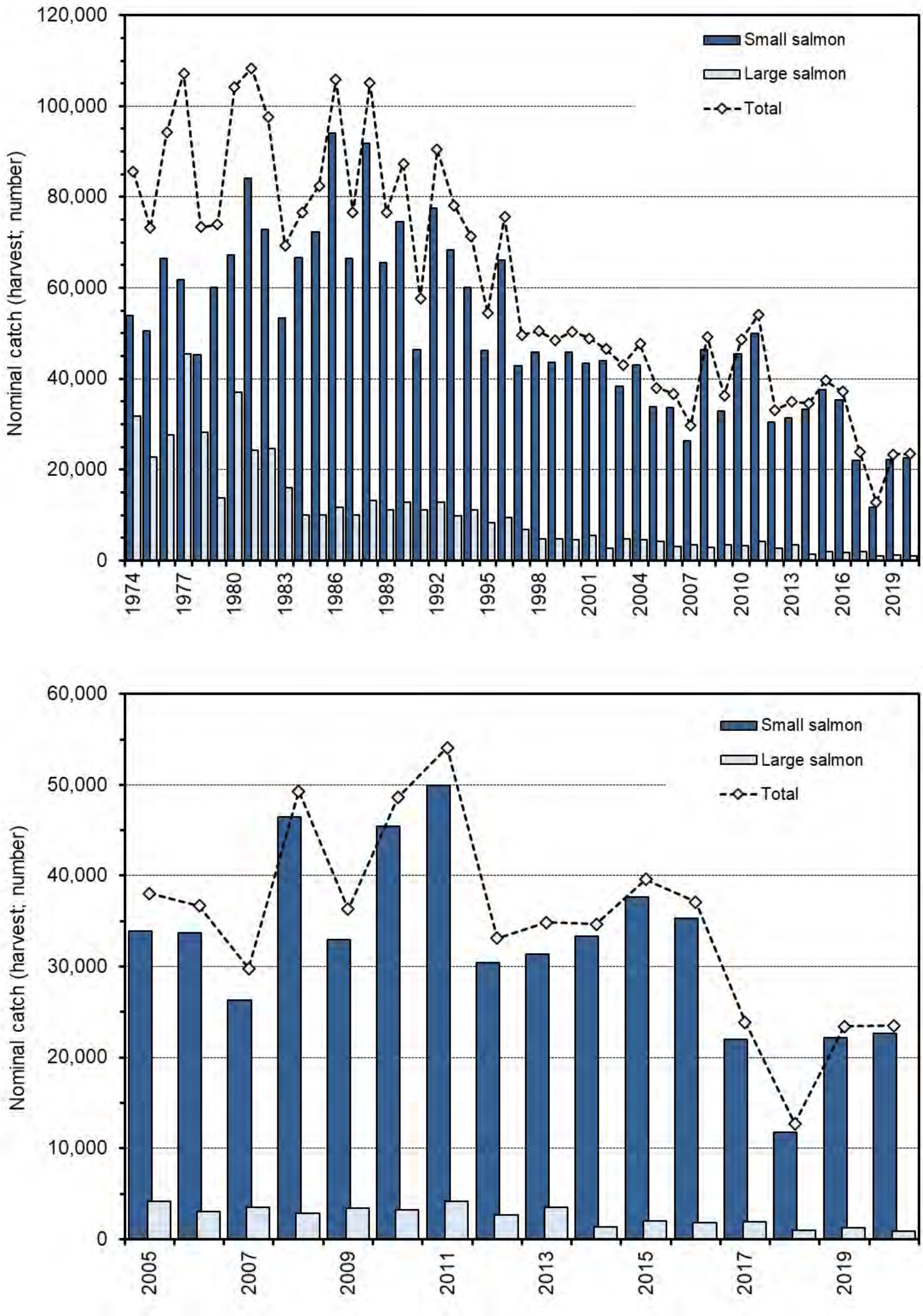


Figure 4.1.3.2. Nominal catch (harvest; number) of small salmon, large salmon, and both sizes combined in the recreational fisheries of Canada, 1974 to 2020 (top panel) and 2004 to 2020 (bottom panel).

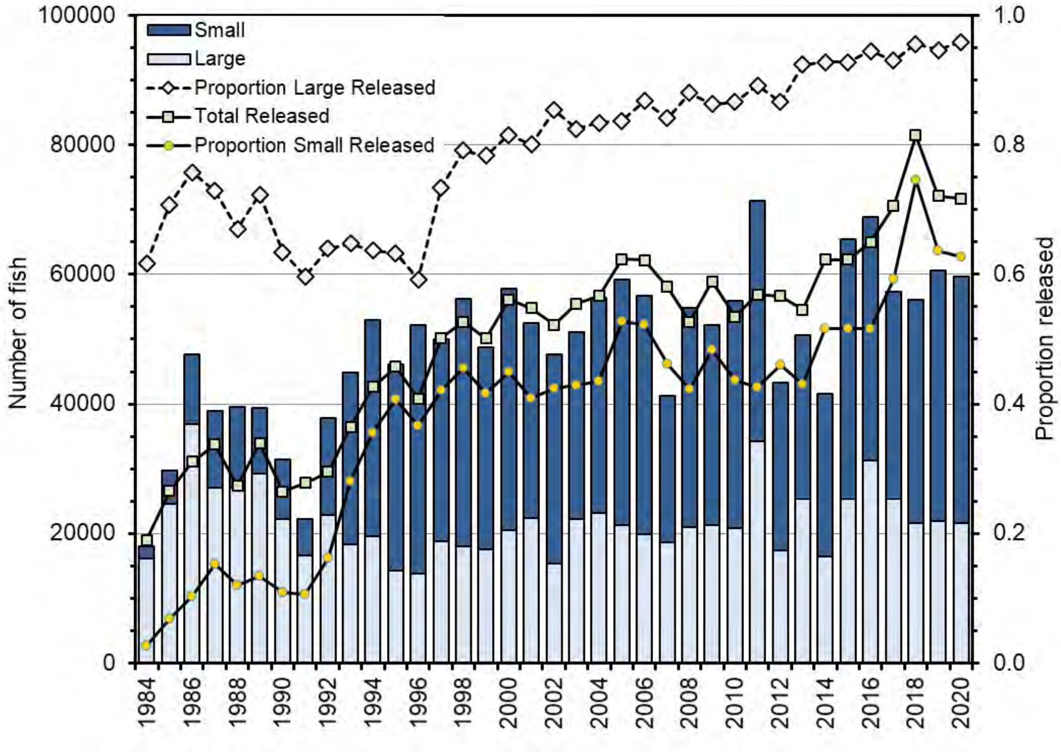


Figure 4.1.3.3. The number (bars) of caught and released small salmon and large salmon in the recreational fisheries of Canada, 1984 to 2020. Black lines represent the proportion released of the total catch (released and retained); small salmon (yellow circle) large salmon (grey diamond) and both sizes combined (grey square).

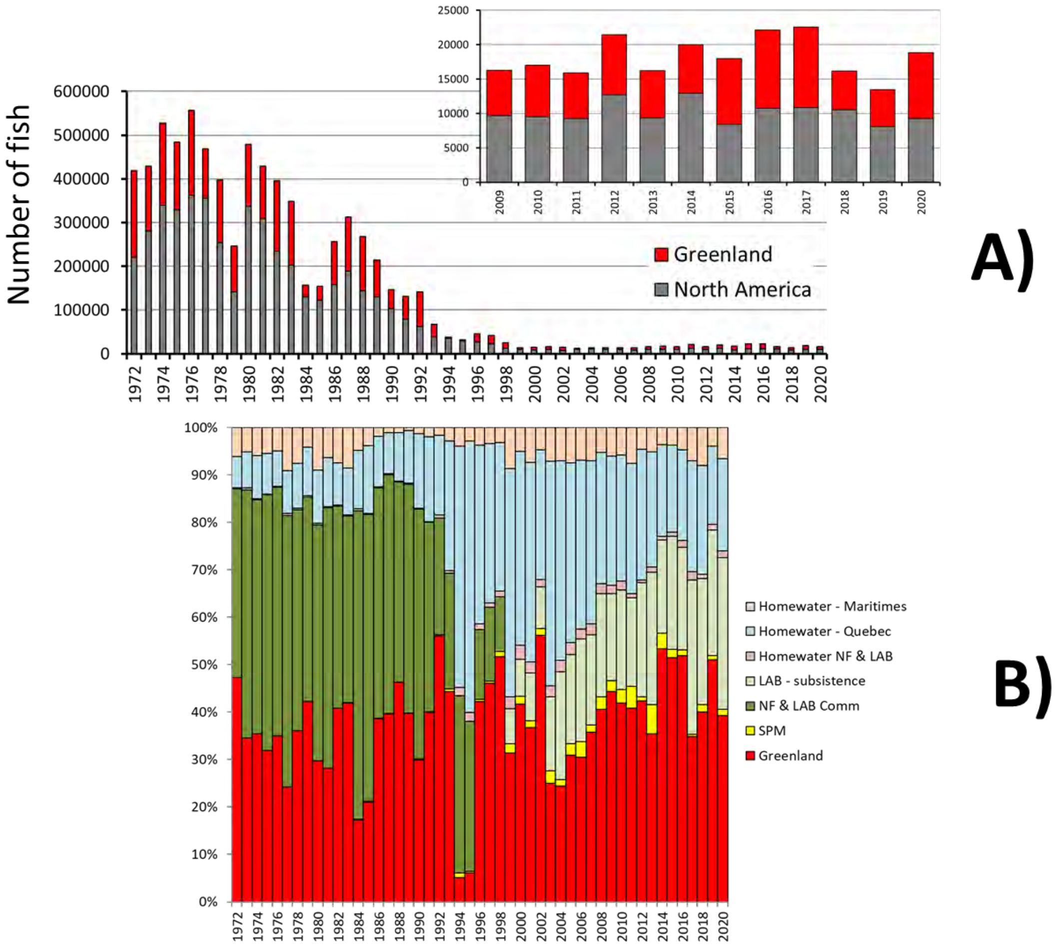


Figure 4.1.4.1. Estimates of 2SW salmon harvest equivalents (number of fish; year of 2SW harvests) taken at Greenland (year – 1) and in North America (upper panel A) and the percentages of the North American origin 2SW salmon harvest equivalents taken in various fishing areas of the North Atlantic (lower panel B) 1972 to 2020.

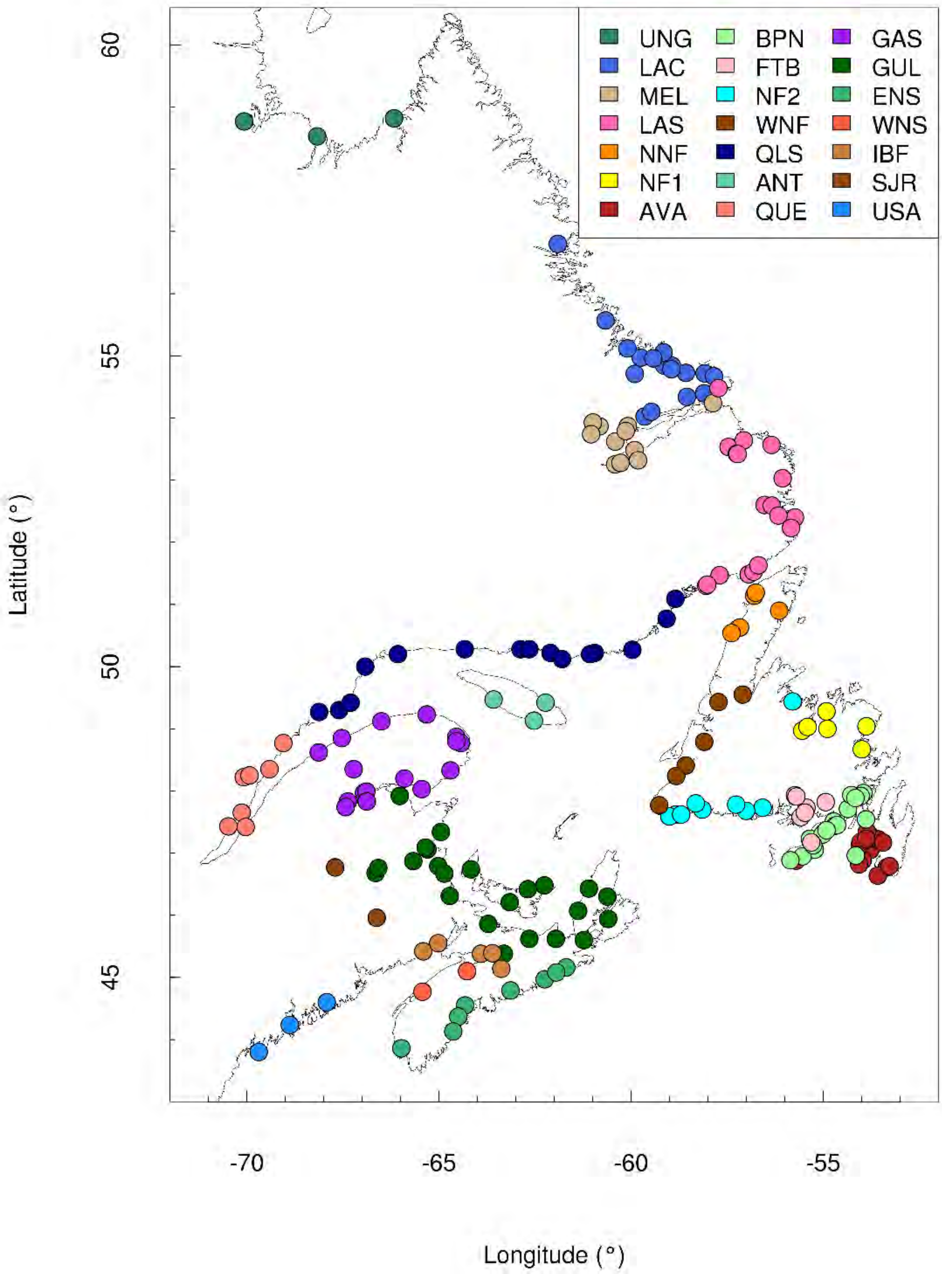


Figure 4.1.5.1 Map of North American sample locations used in the development of the SNP range wide baseline for Atlantic salmon (Jeffrey *et al.*, 2018). The 21 North American reporting groups are labelled and identified by colour).

See Figure 4.1.5.2 for full range wide baseline sampling locations.

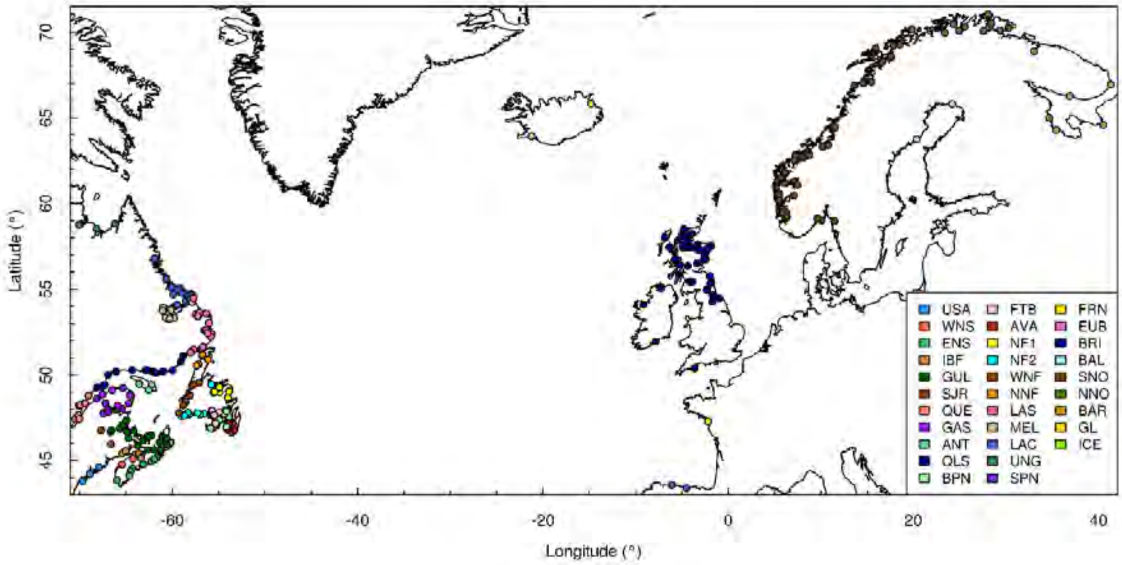
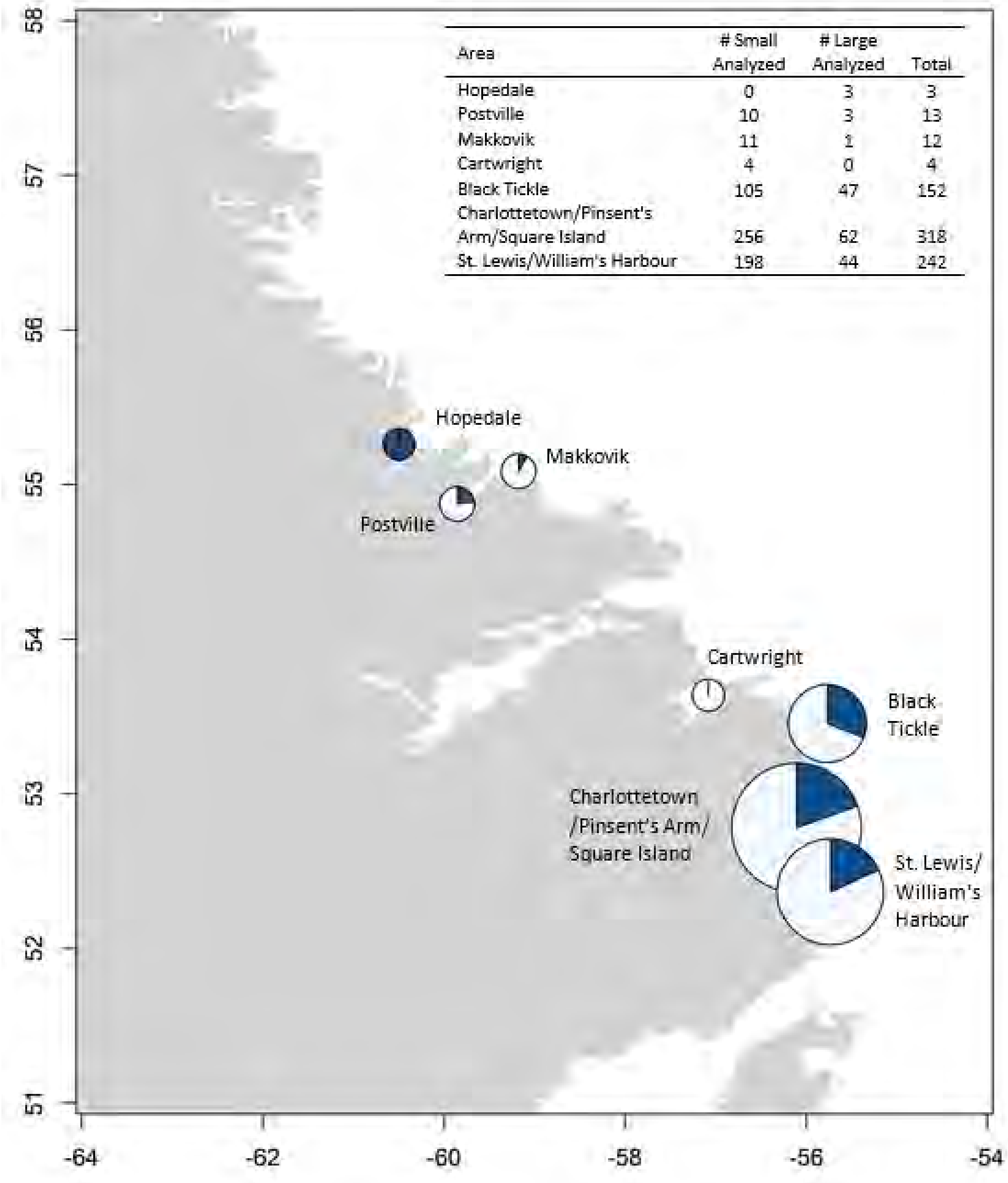


Figure 4.1.5.2. Map of range wide sample locations used in the development SNP baseline for Atlantic salmon and the 31 defined reporting groups (labelled and identified by colour) (Jeffrey *et al.*, 2018). See Figure 4.1.5.1 for finer resolution of North American locations.



Area	# Small Analyzed	# Large Analyzed	Total
Hopedale	0	3	3
Postville	10	3	13
Makkovik	11	1	12
Cartwright	4	0	4
Black Tickle	105	47	152
Charlottetown/Pinsent's Arm/Square Island	256	62	318
St. Lewis/William's Harbour	198	44	242

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 2020.

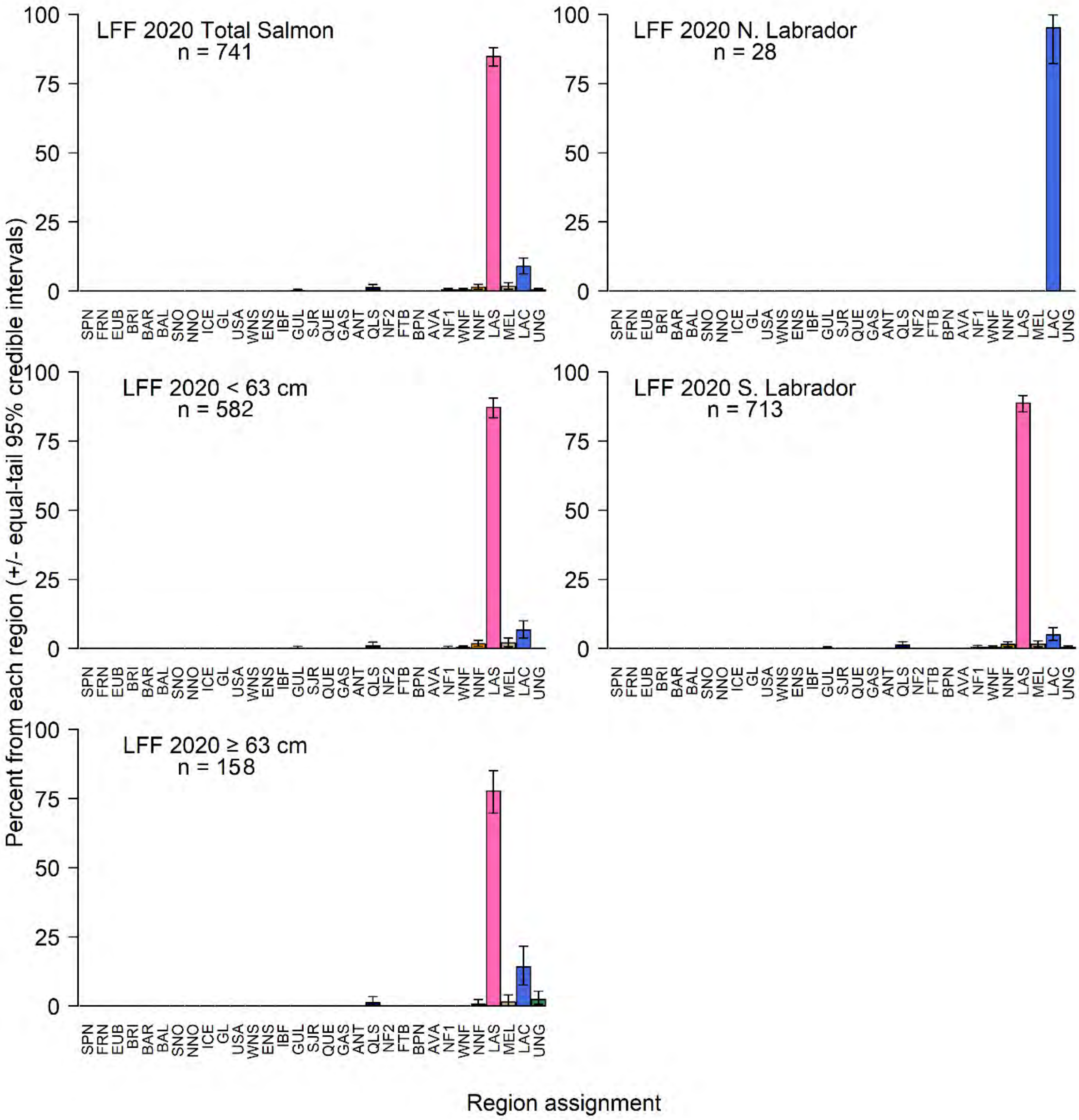


Figure 4.1.5.4. Bayesian estimate of mixture composition of samples from the Labrador Atlantic salmon fisheries (LFF) for 2020 by size group (small <63 cm, large ≥63 cm) and region (Figure 4.1.2.1: SFA 1A – N. Labrador, SFA 1B – Lake Melville, and SFA 2 –S. Labrador) using the SNP range wide baseline 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.

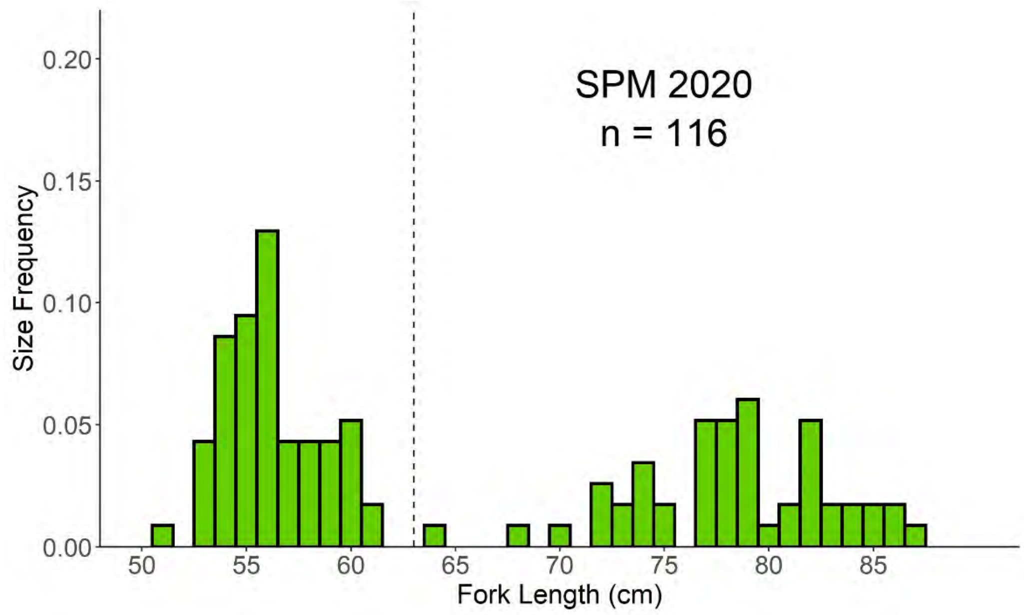


Figure 4.1.5.6. Length–frequency distribution of Atlantic salmon samples from the Saint Pierre and Miquelon Atlantic salmon fishery in 2020. The dotted vertical line is the 63 cm fork length cut-off for small salmon (< 63 cm) and large salmon (≥ 63 cm).

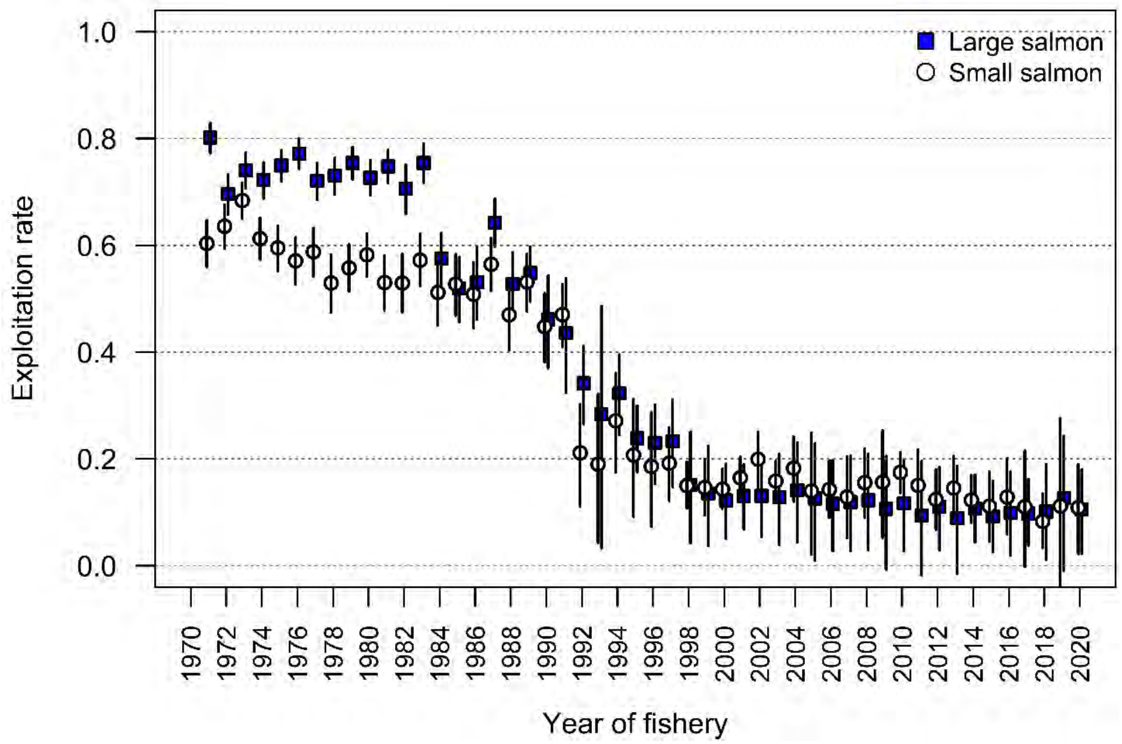


Figure 4.1.6.1. Exploitation rates in North America on the North American stock complex of small and large salmon 1971 to 2020. The symbols are the median and the error bars are the 5th to 95th percentiles of the distributions from Monte Carlo simulation.

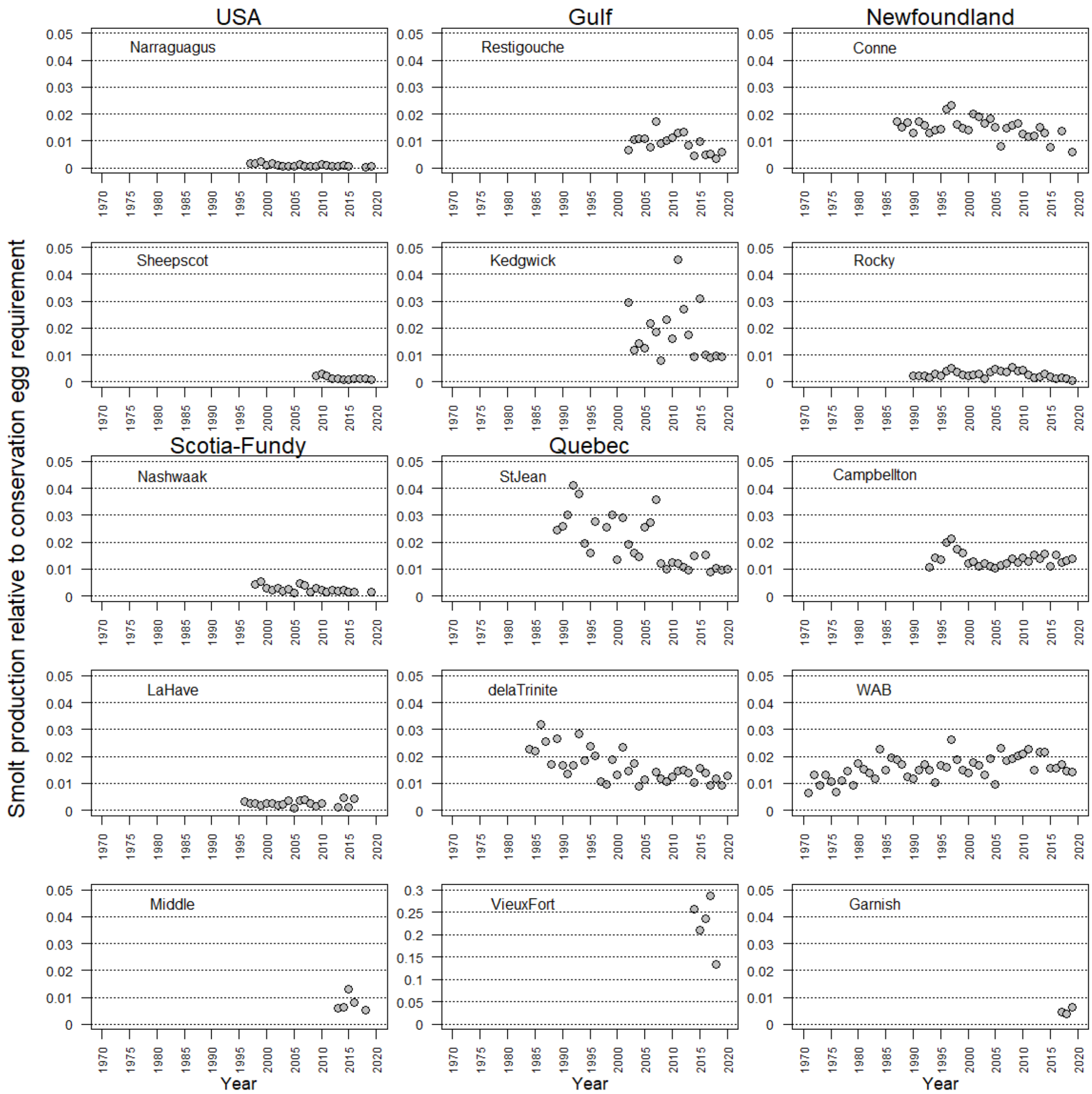


Figure 4.3.1.1. Time-series of wild smolt production from thirteen monitored rivers in eastern Canada and two rivers in eastern USA, 1970 to 2020. Smolt estimates are only available for two rivers (de la Trinite and St Jean) in 2020. Smolt production is expressed as a proportion of the conservation egg requirements for the river. Note y-axis range change for the Vieux-Fort River relative to other rivers.

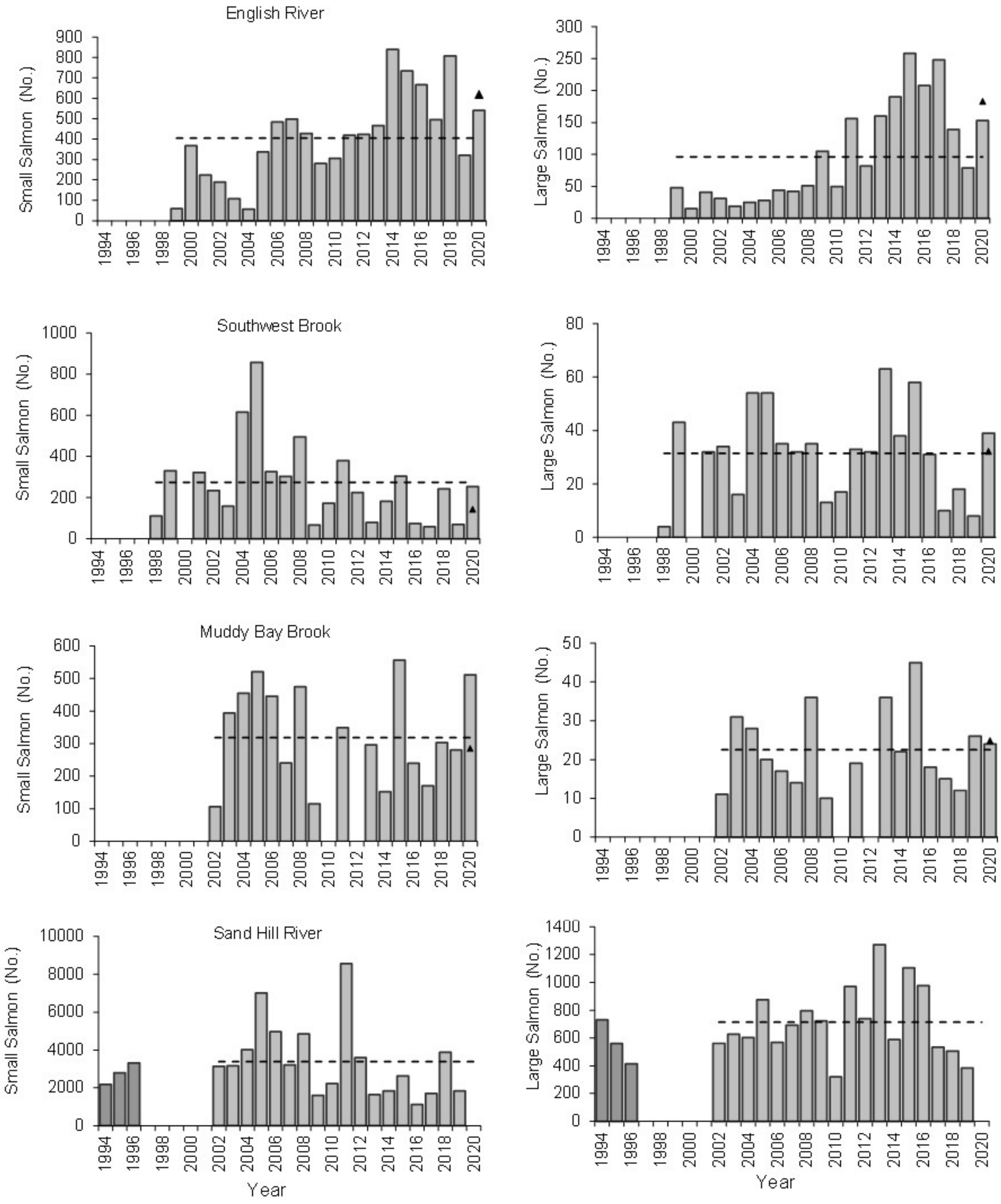


Figure 4.3.2.1. Total returns of small salmon (left column) and large salmon (right column) to English River (SFA 1), Southwest Brook (Paradise River) (SFA 2), Muddy Bay Brook (SFA 2), and Sand Hill River (SFA 2) Labrador, 1994–2020. The solid horizontal line represents the pre-moratorium (commercial salmon fishery in Newfoundland and Labrador) mean, the dashed line the moratorium mean, and the triangles the previous six-year mean.

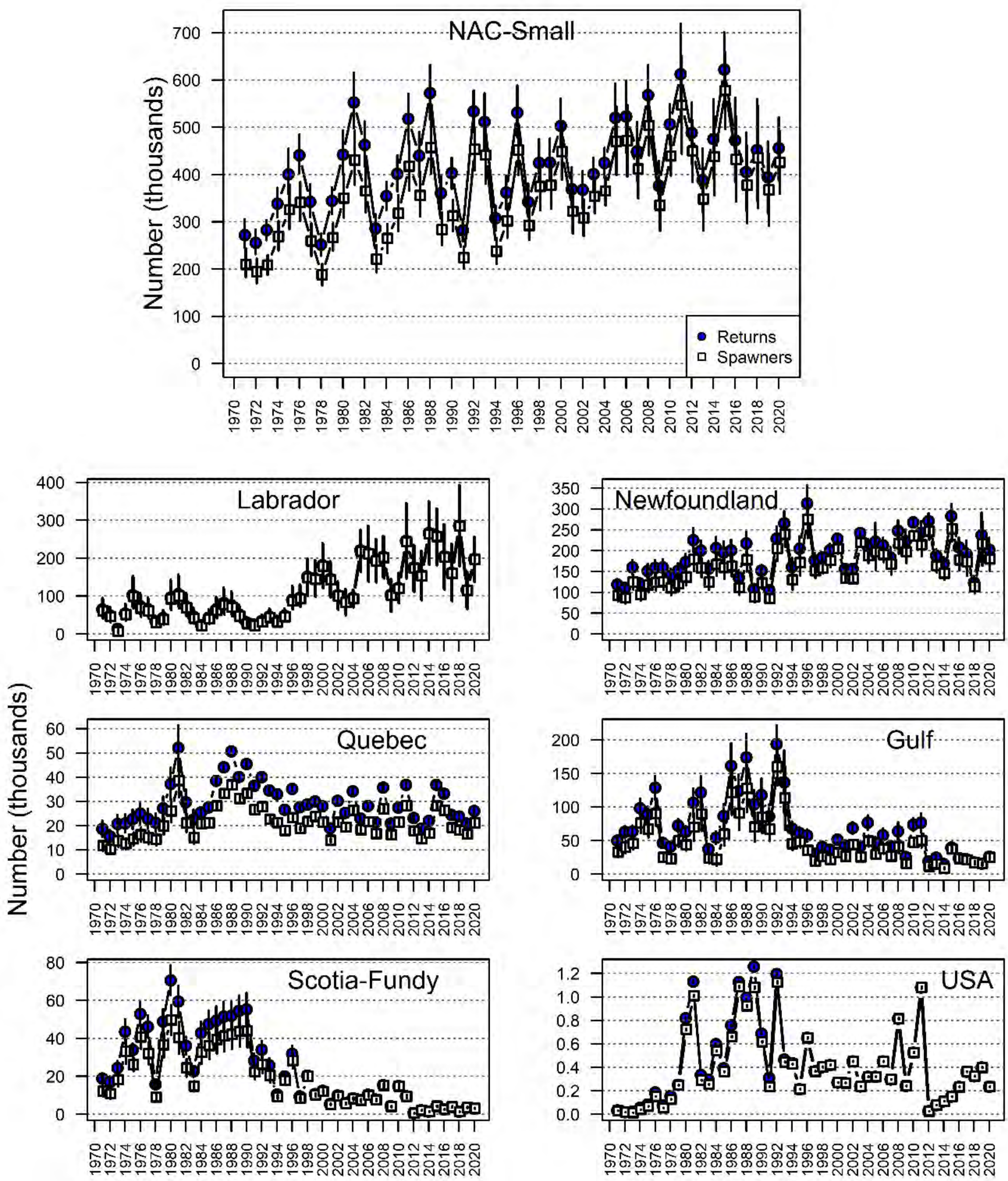


Figure 4.3.2.2. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open squares) of small salmon for NAC and to each of the six assessment regions 1971 to 2020. Returns and spawners for Scotia-Fundy do not include those from SFA 22 and a portion of SFA 23.

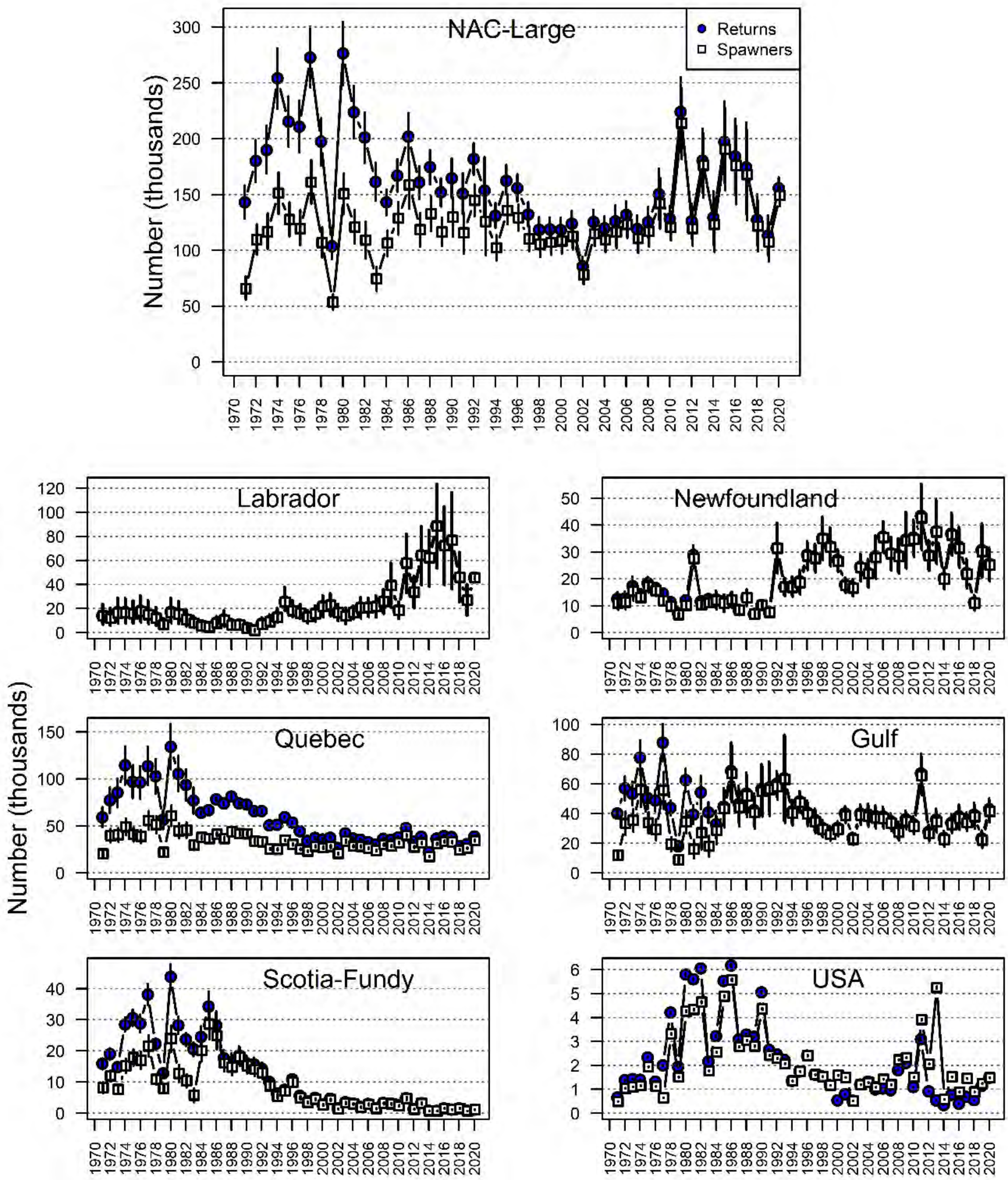


Figure 4.3.2.3. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open squares) of large salmon for NAC and to each of the six assessment regions 1971 to 2020. Returns and spawners for Scotia-Fundy do not include those from SFA 22 and a portion of SFA 23. For USA, estimated spawners exceed the estimated returns due to adult stocking restoration efforts.

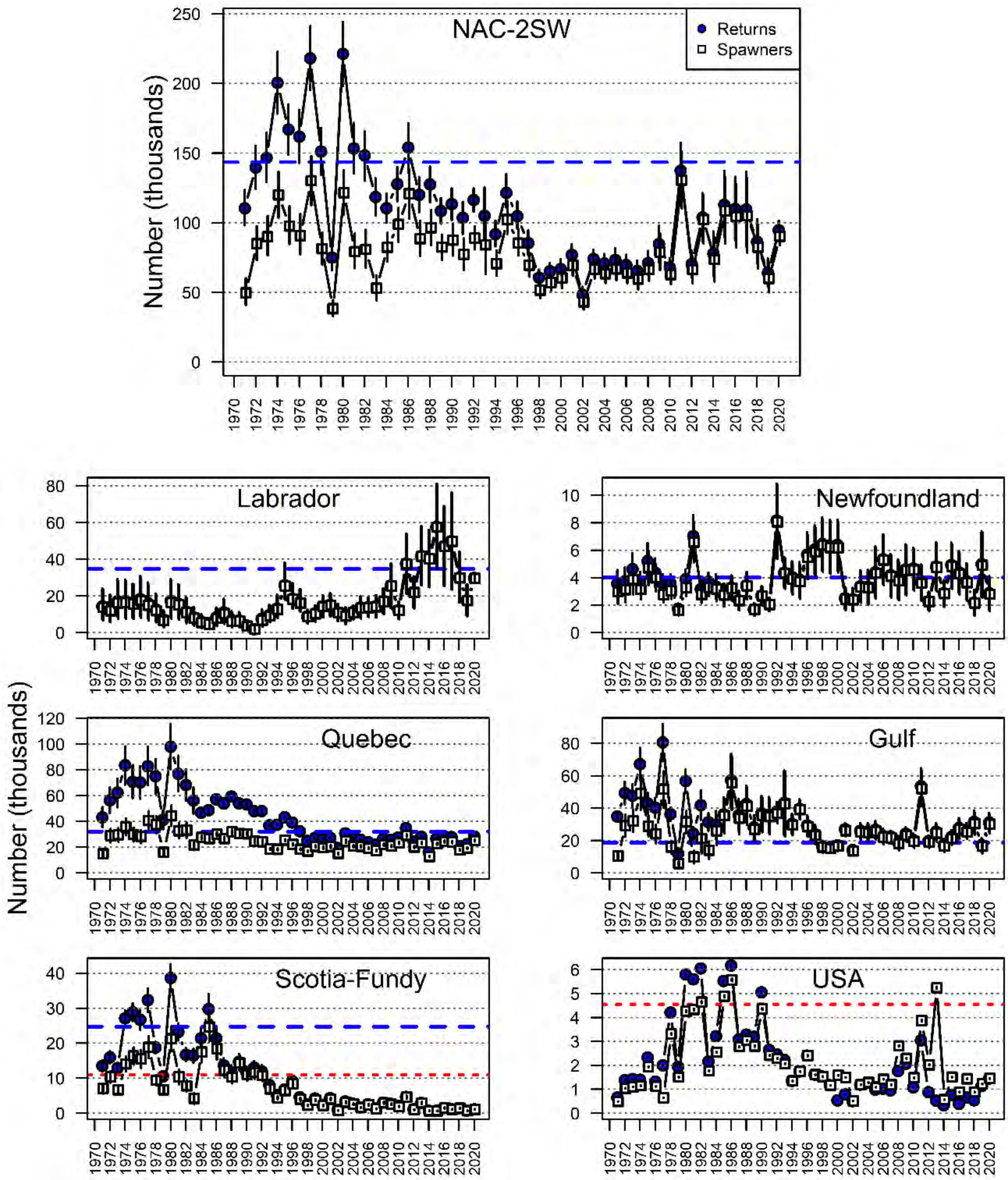


Figure 4.3.2.4. Estimated (median 5th to 95th percentile range, X 1000) returns (shaded circles) and spawners (open squares) of 2SW salmon for NAC and to each of the six assessment regions 1971 to 2020 The dashed line is the corresponding 2SW Conservation Limit for NAC overall and for each region; the 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.

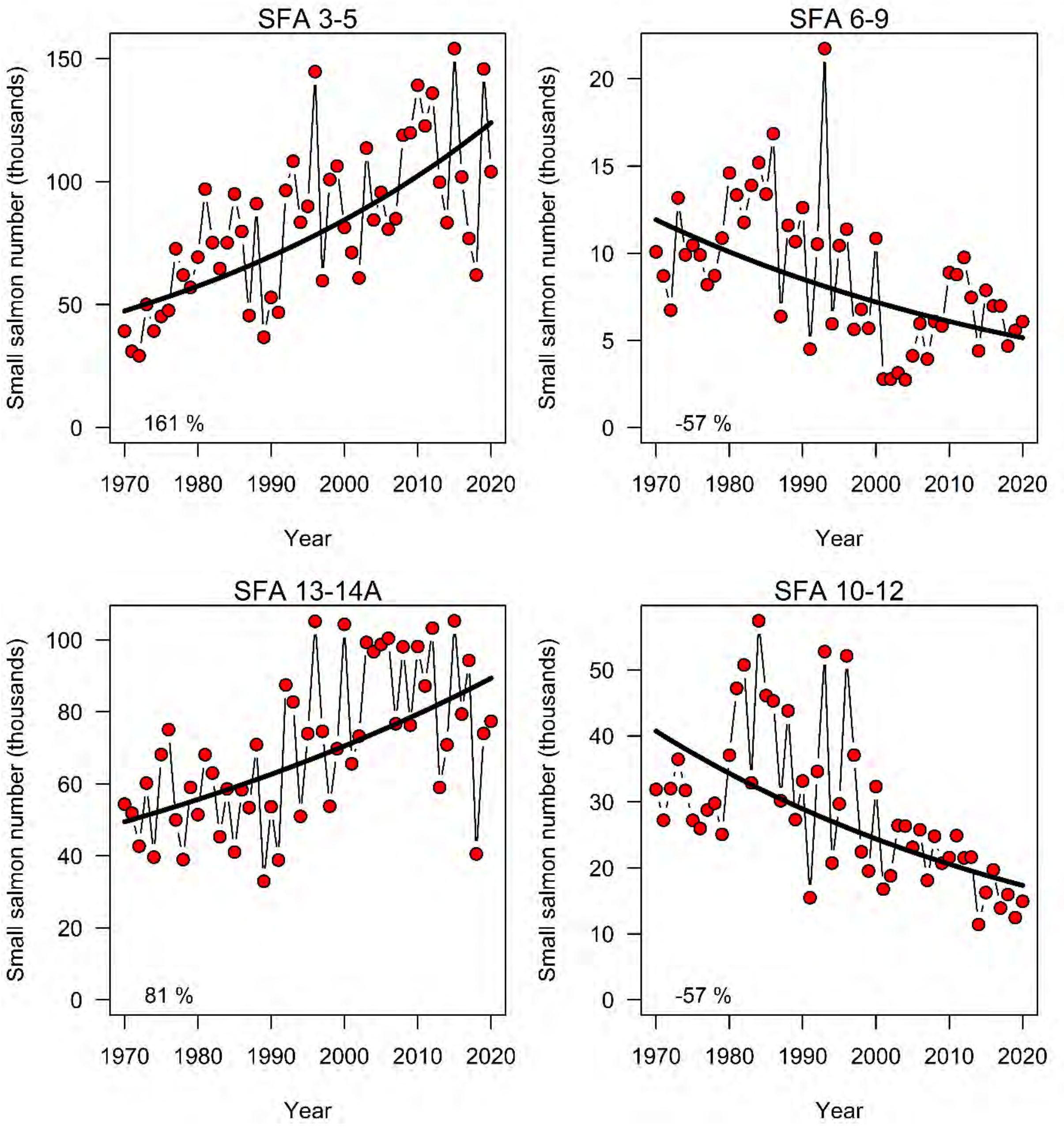


Figure 4.3.2.5. Estimated (median, X 1000) returns of small salmon to subregions of Newfoundland (SFA locations are shown in Figure 4.1.2.1) over the period 1971 to 2020. The exponential trend line and the percent change over the time-series are shown in each panel.

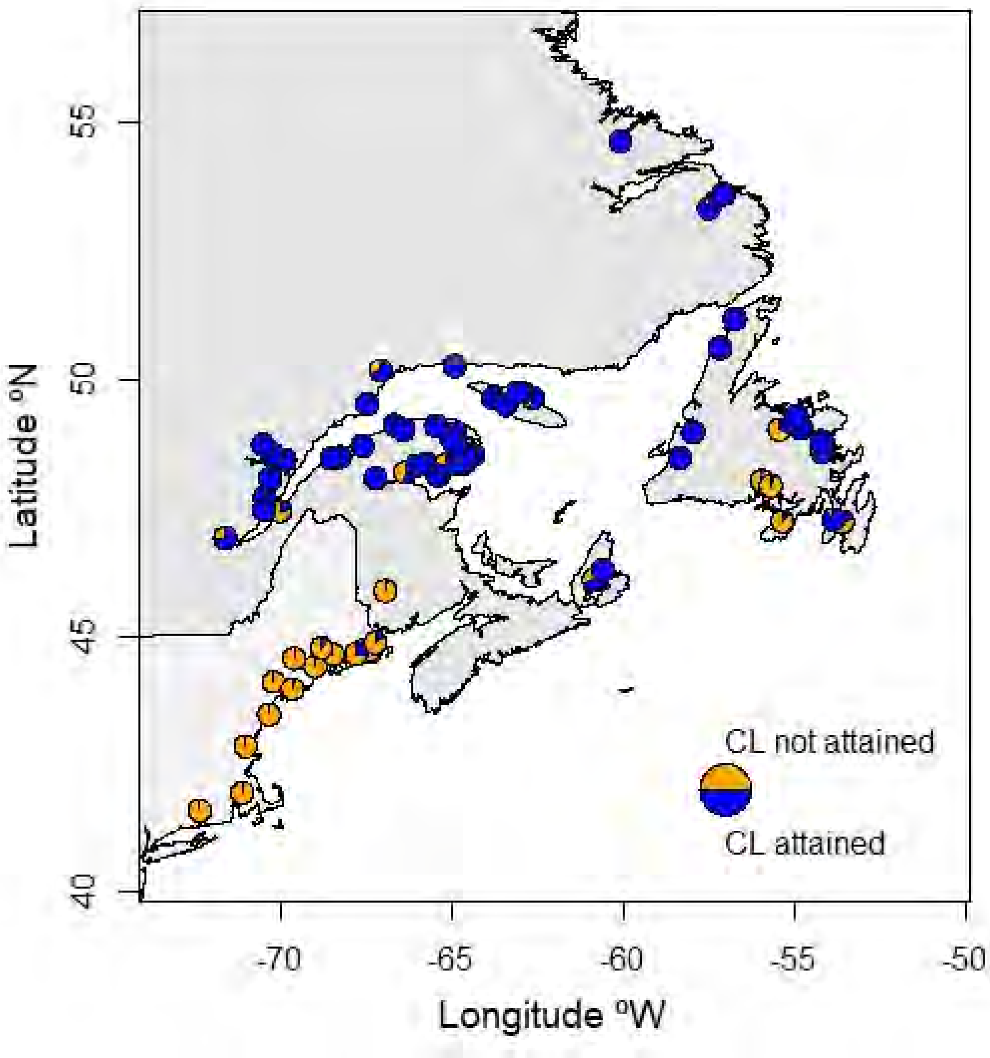


Figure 4.3.4.1. Proportion of the conservation requirement attained in the 73 assessed rivers of the North American Commission area in 2020.

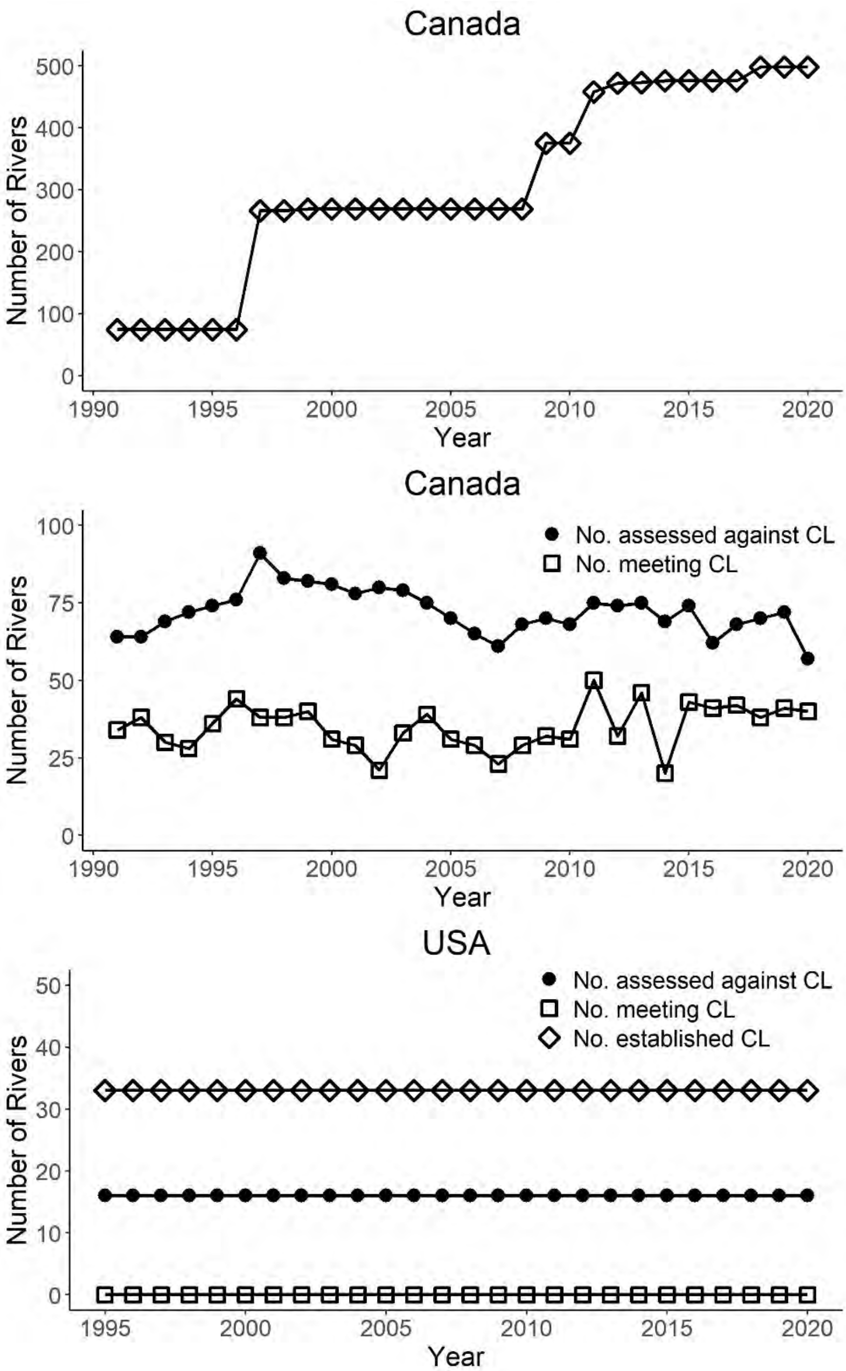


Figure 4.3.4.2. Time-series for Canada and the USA showing the number of rivers with established CLs, the number rivers assessed, and the number of assessed rivers meeting CLs for the period 1991 to 2020.

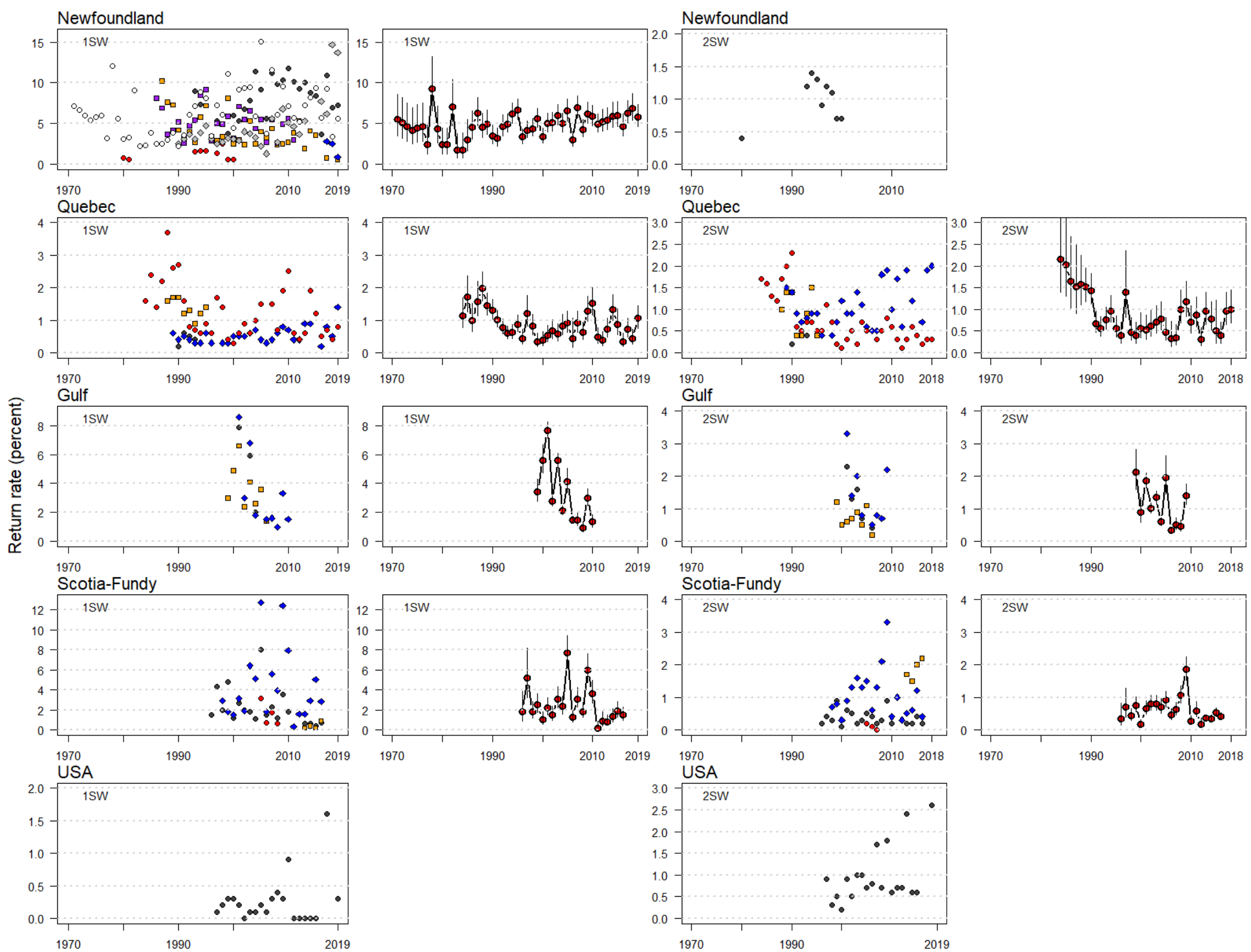


Figure 4.3.5.1. Estimated annual return rates (left and third column of panels; individual rivers are shown with different symbols and colours) and least squared (or marginal mean) mean annual return rates (with one standard error bars) (second and right column of panels) of wild origin smolts to 1SW and 2SW salmon to the geographic areas of North America. The standardised 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.

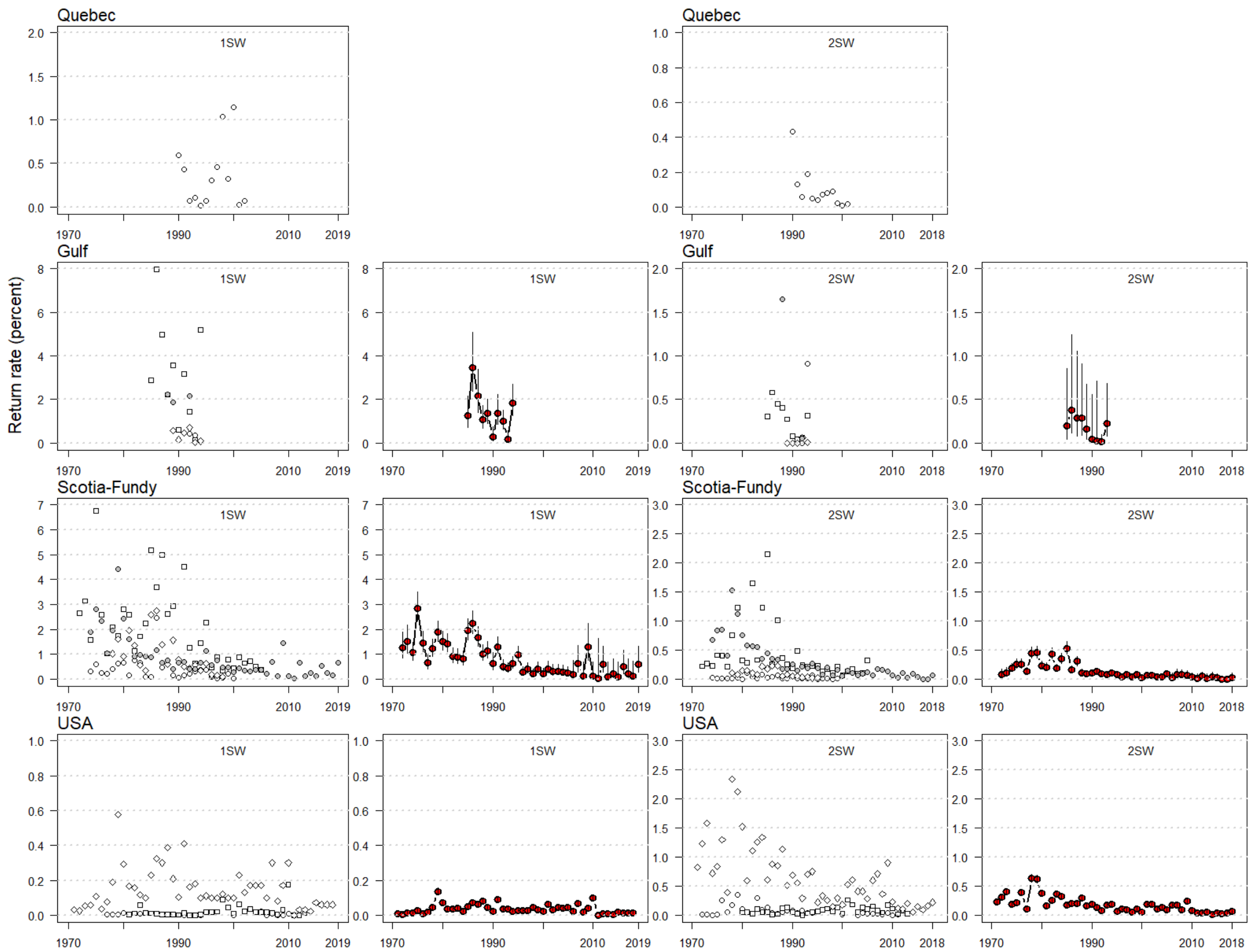


Figure 4.3.5.2. Estimated annual return rates (left and third column of panels; individual rivers are shown with different symbols and colours) and least squared (or marginal mean) mean annual return rates (with one standard error bars) of hatchery origin smolts to 1SW and 2SW salmon to the geographic 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. Standardised rates are not shown for regions with a single population.

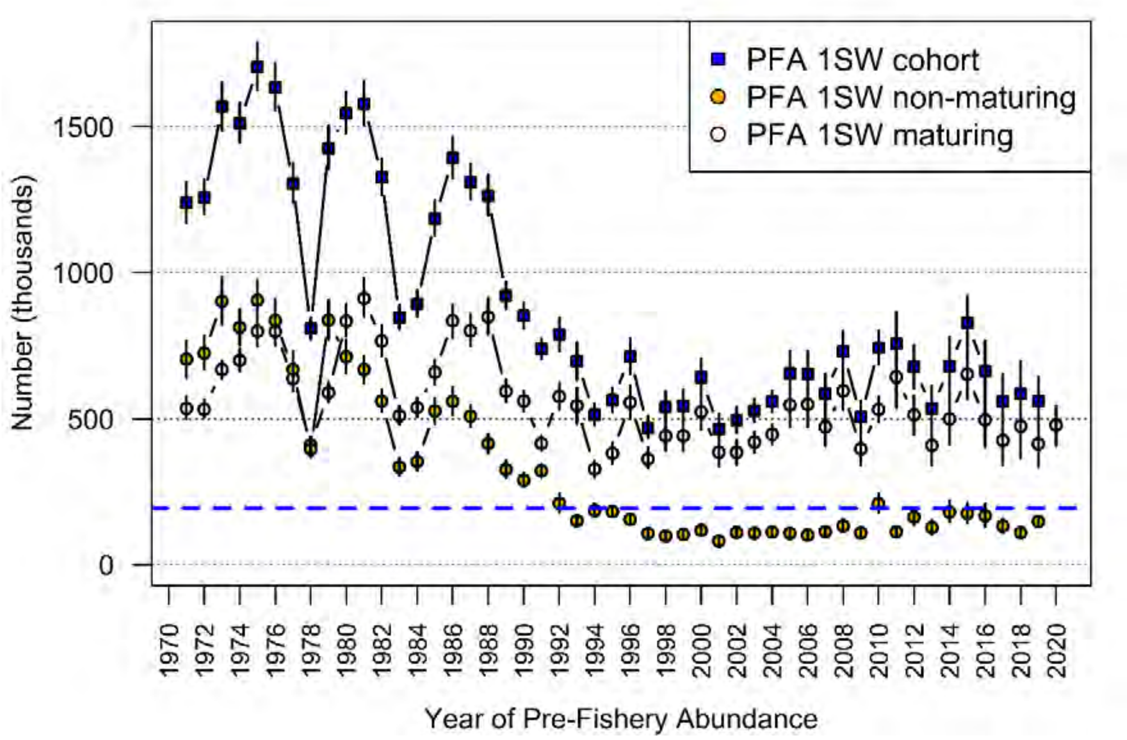


Figure 4.3.6.1. Estimated (median, 5th to 95th percentile range, X 1000) Pre-fishery Abundance (PFA) for 1SW maturing, 1SW non-maturing, and total cohort of 1SW salmon for NAC, PFA years 1971 to 2020. The dashed blue horizontal line is the corresponding sum of the 2SW conservation limits for NAC (143 494) corrected for 11 months of natural mortality (193 697) against which 1SW non-maturing are assessed.

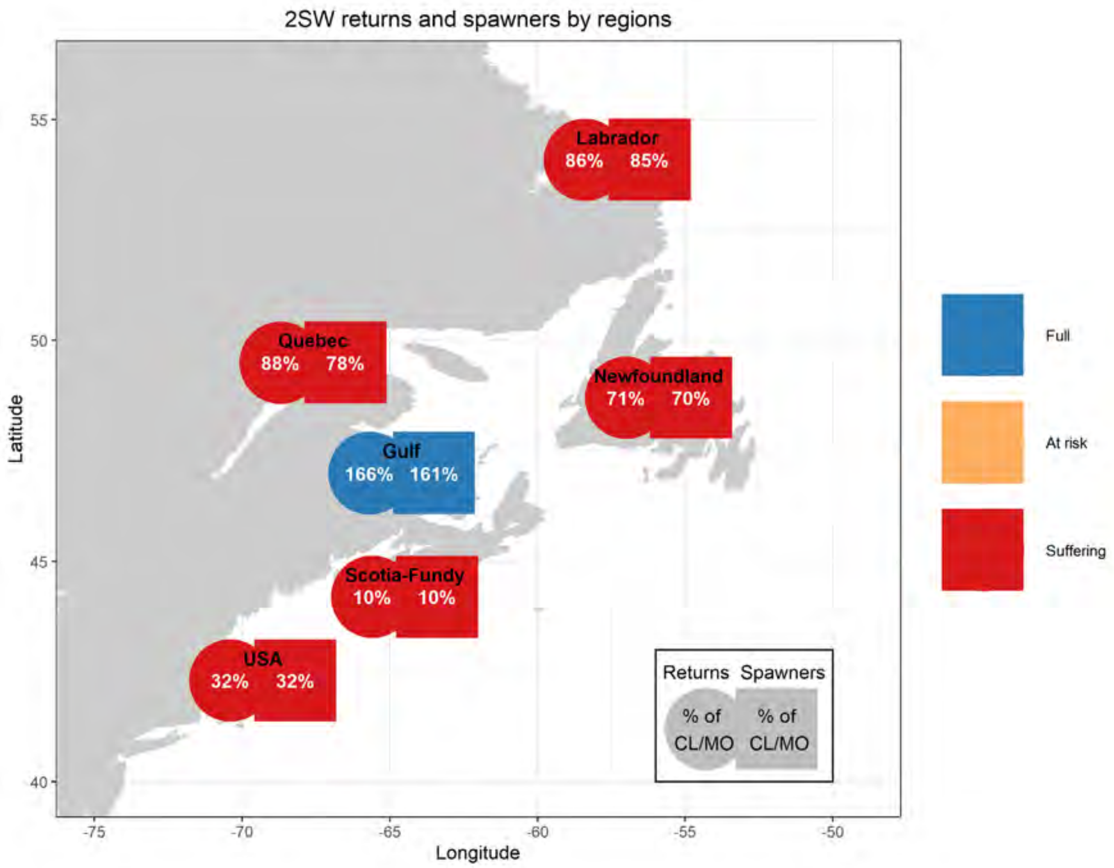


Figure 4.3.7.1. Estimated returns (circle symbol) and spawners (square symbol) of 2SW salmon in 2020 to six assessment regions of North America relative to ICES stock status categories. The percentage of the 2SW CLs for the four northern regions and to the rebuilding management objectives (MO) for the 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).

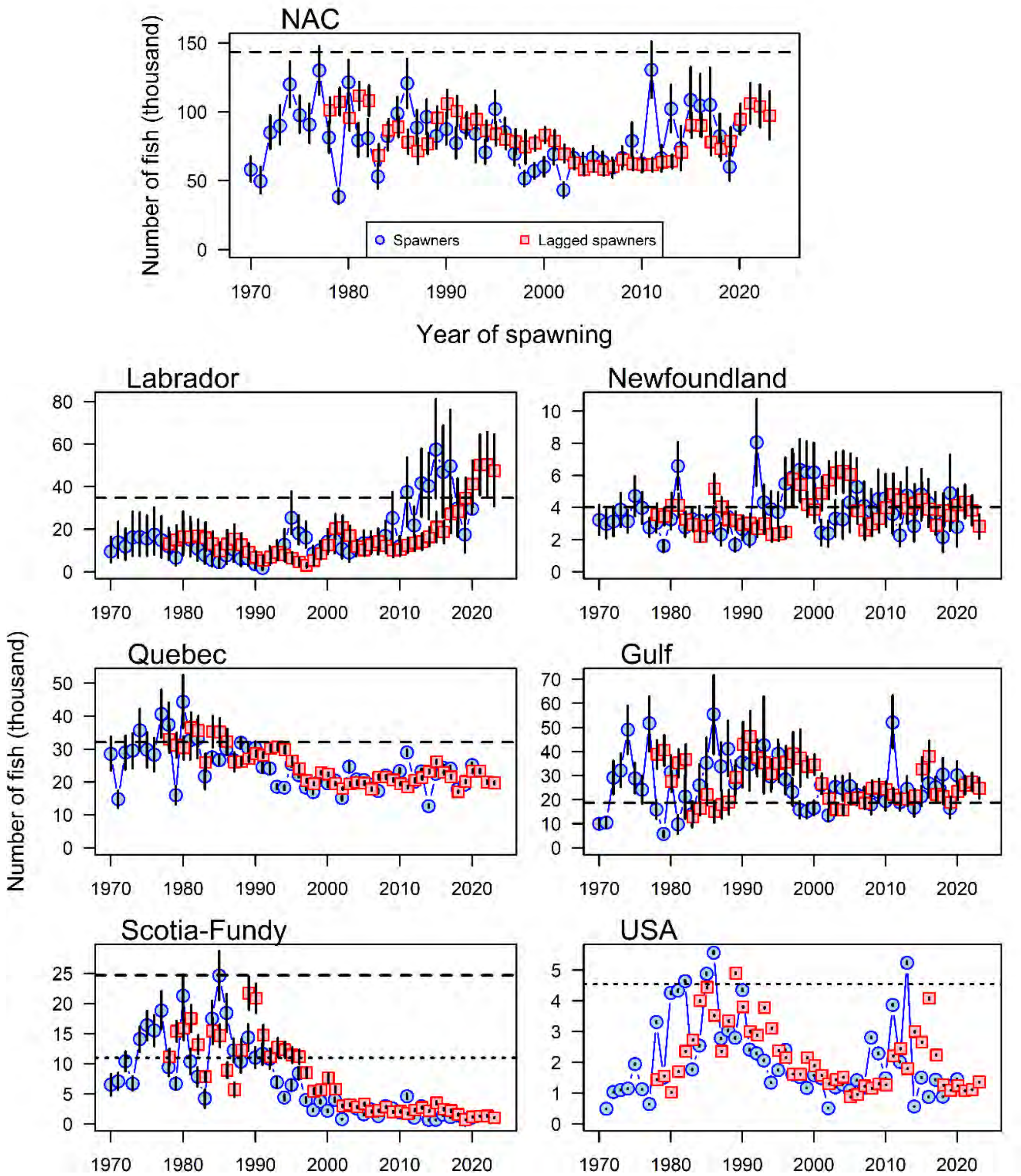


Figure 4.4.3.1. Median (5th to 95th percentile range) of spawners (circles) and lagged spawners (squares) of 2SW salmon to NAC overall and for each of the six regions. For spawners, year corresponds to the year of spawning. For lagged spawners, year corresponds to the year of PFA. The dashed horizontal line is the corresponding 2SW Conservation Limit for NAC overall and for each region; the 2SW CL for the US (29 990 fish) is off scale in the plot. The dotted horizontal line in Scotia-Fundy and USA panels are the region-specific management objectives.

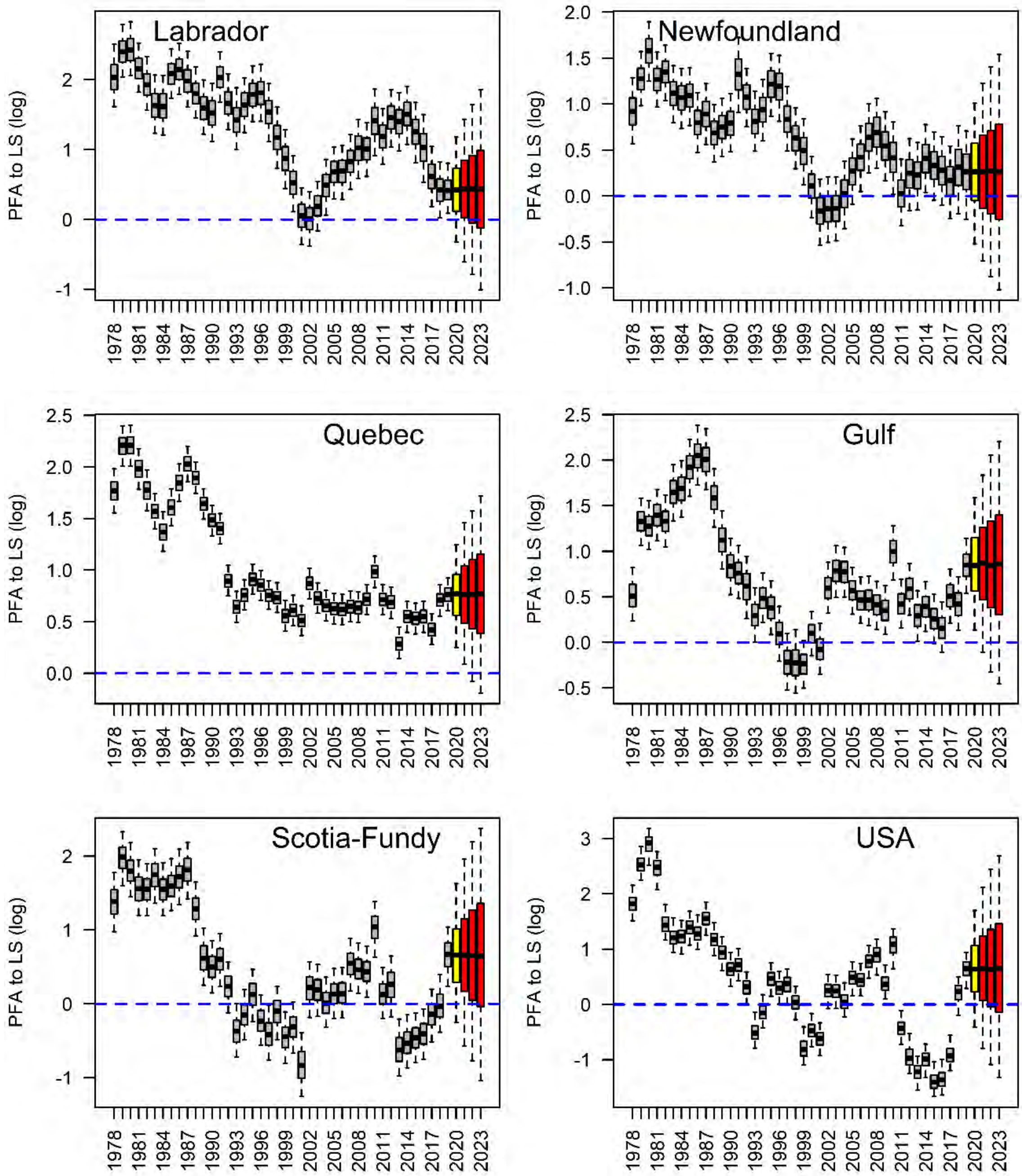


Figure 4.4.3.2. Region-specific PFA to LS ratio (on log scale) for PFA years 1978 to 2023. The values for 2020 (yellow shading) and for 2021 to 2023 (red shading) are predicted values. The horizontal dashed blue line is the PFA to LS ratio on the log scale of zero, which equates to a PFA to LS ratio of one. Boxplots are interpreted as follows: the dashed line is the median, the shaded rectangle is the inter-quartile range and the dashed vertical line is the 5th to 95th percentile range.

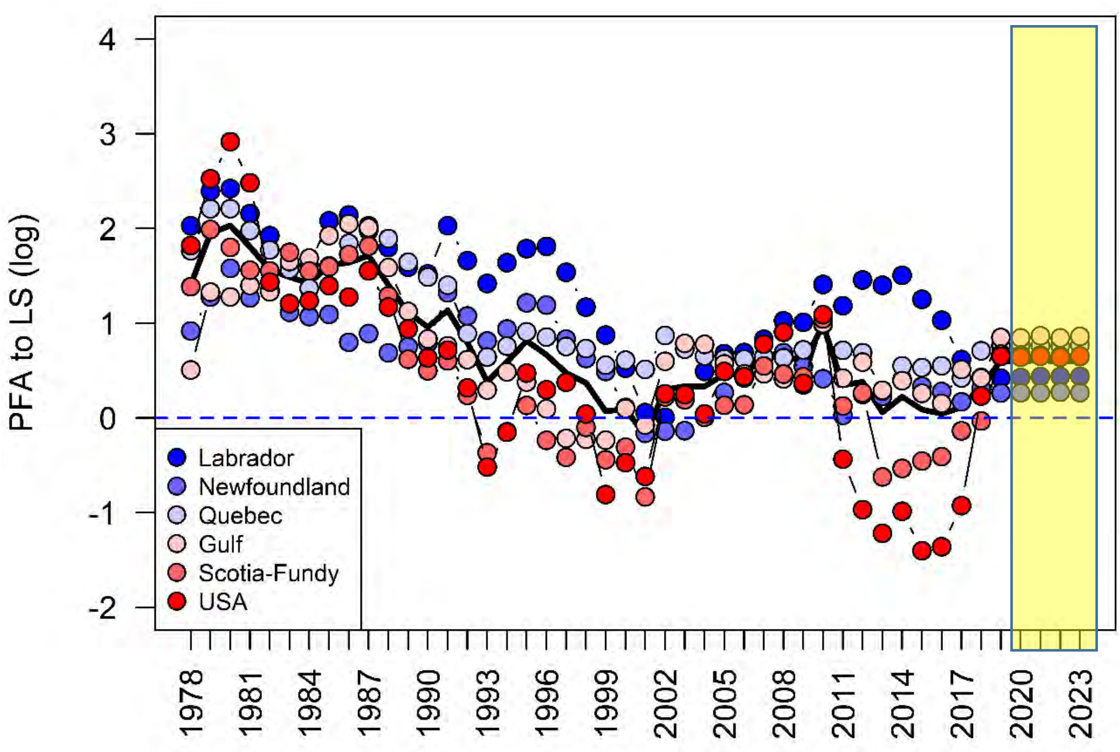


Figure 4.4.3.3. Region-specific (median) PFA to LS ratio (log scale) and mean over all regions (solid black line) for NAC for PFA years 1978 to 2023. The horizontal dashed blue line is the PFA to LS ratio on the log scale of zero, which equates to a PFA to LS ratio of one. The values for 2020 to 2023 in the shaded rectangle are forecast values.

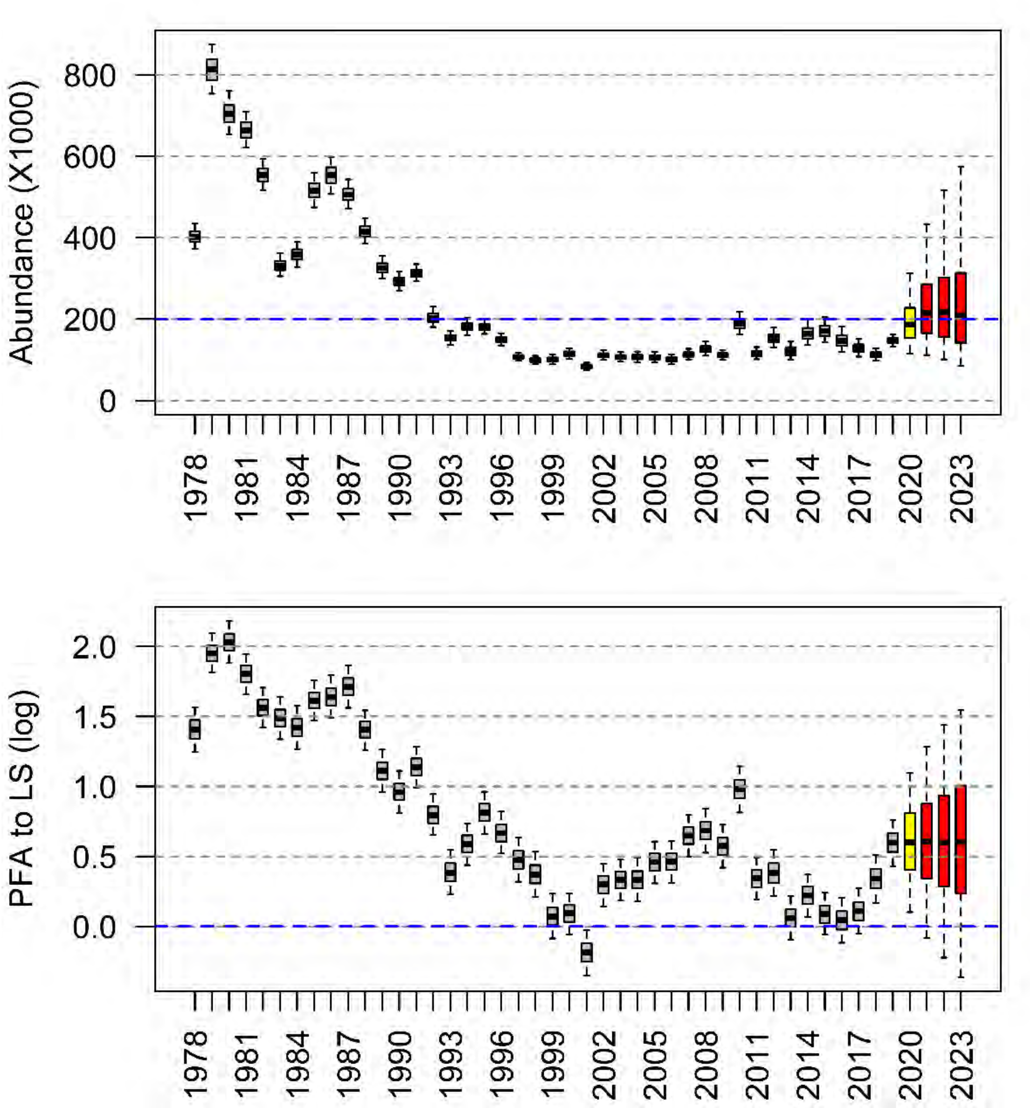


Figure 4.4.3.4. Total PFA (number of fish X 1000; top panel) for NAC prior to exploitation and PFA to LS ratio (log scale; bottom panel) for NAC overall. The dashed blue line in the top panel is the corresponding sum of the 2SW conservation and management objectives for NAC, corrected for eleven months of natural mortality. Boxplots are interpreted as in Figure 4.4.3.2.

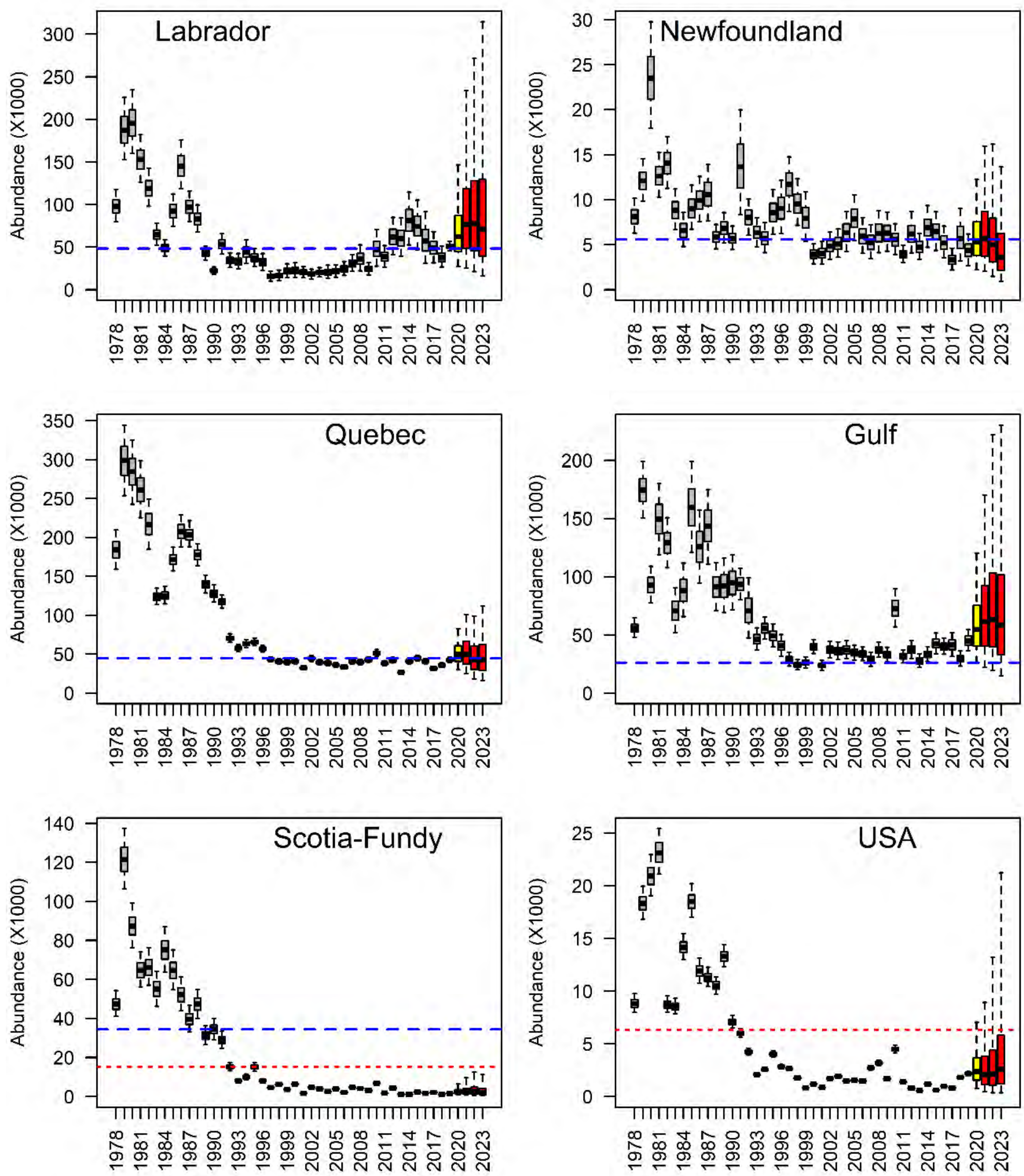


Figure 4.4.3.5. Region-specific PFA values for PFA years 1978 to 2023. The values for 2020 (yellow shading) and for 2021 to 2023 (red shading) are predicted based on Lagged Spawners and forecasts of the PFA to LS ratio. The dashed blue line is the corresponding 2SW conservation limit reserve for each region. For Scotia-Fundy and US the dotted red line corresponds to the 2SW management objectives (adjusted for eleven months of natural mortality). Boxplots are interpreted as in Figure 4.4.3.2.

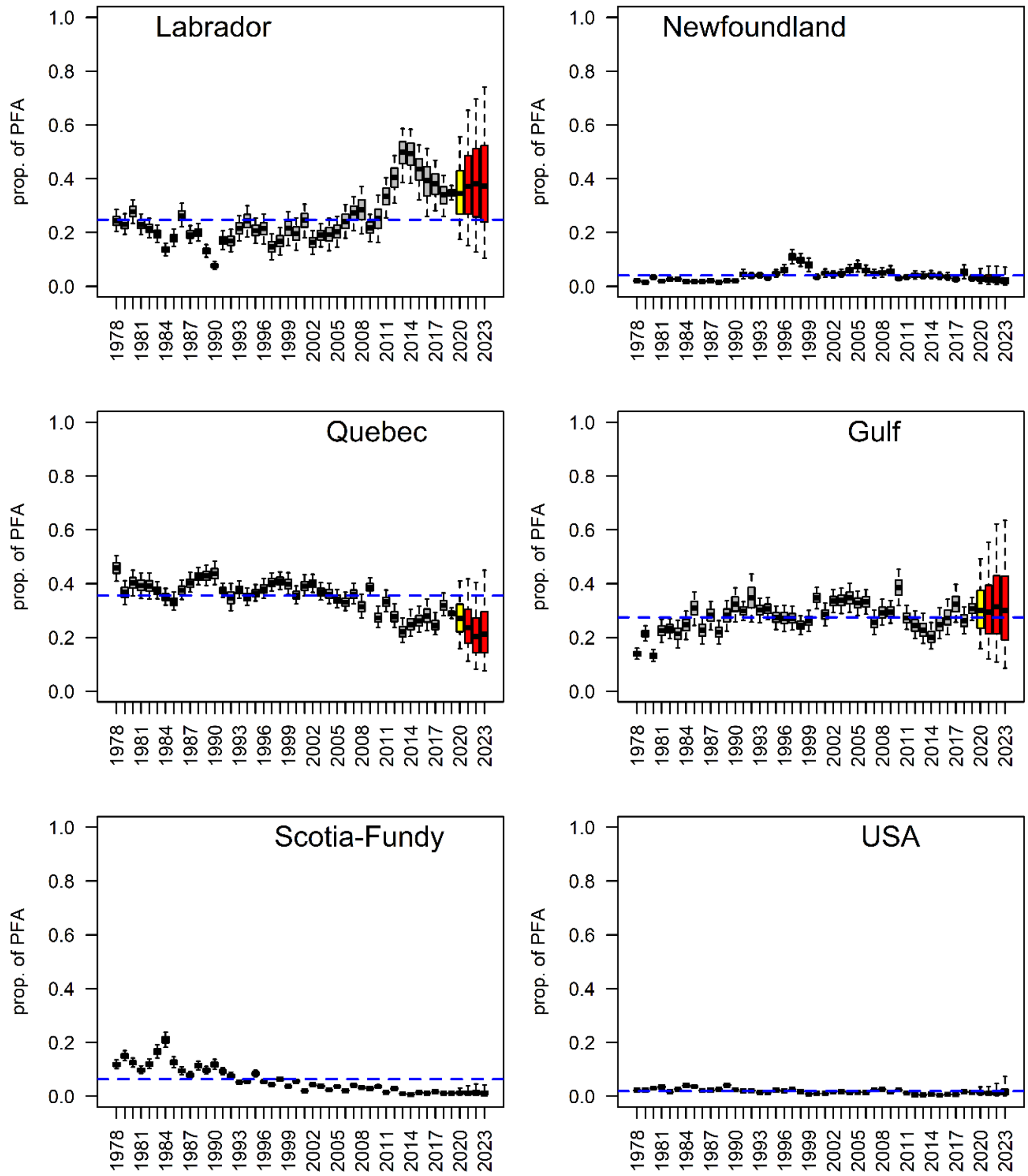


Figure 4.4.3.6. Proportion of PFA in each region relative to overall PFA for NAC. The horizontal blue line in each panel is the average proportion of total PFA for NAC for the PFA years 1978 to 2023. Boxplots are interpreted as in Figure 4.4.3.2.

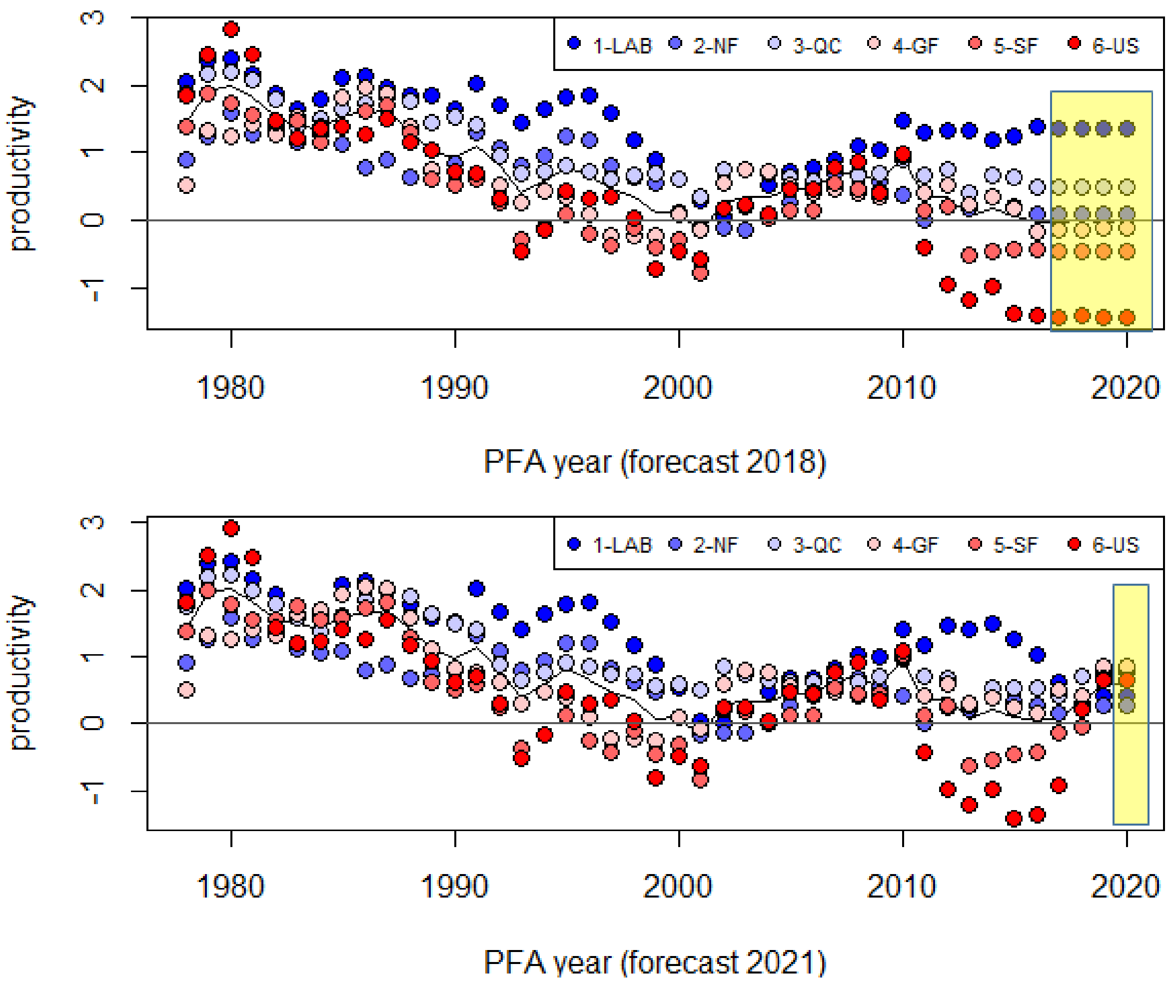


Figure 4.4.4.1. Comparison of the estimated (median value) productivity parameter by region and overall for NAC (mean of regional values, black line) from the assessment in 2018 (upper panel; ICES 2018) and the corresponding productivity values estimated with updated values in the assessment this year (lower panel) for the PFA years 1978 to 2020. The points in both panels in the shaded rectangle are forecast values for the productivity parameter for the corresponding assessment periods.

5 Atlantic salmon in the West Greenland Commission

5.1 NASCO has requested ICES to describe the key events of the 2020 fishery

The Atlantic salmon fishery is regulated according to the Government of Greenland's Executive Order no. 32 of 28 August 2020. Only hooks and fixed gillnets are allowed to target salmon directly and the minimum mesh size has been 140 mm (stretched mesh) since 1985. In recent decades the fishing season has gradually been reduced from August 1 to August 15 (2015) to September 1 (2019) with a closing date of 31 October or until the total quota was reached.

Commercial fishers are allowed to fish single gillnets fixed to the shore, with no limit on the number of gillnets that can be fished. Driftnetting has not been allowed since 2020. 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. Fishing beyond 40 nautical miles from the shoreline is forbidden. Gillnets are the preferred gear in Greenland, but rod and reel catches and bycatch in pound nets are also noted in small amounts within the catch reports.

The procedures for reporting salmon harvested in Greenland have previously been reported on (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. Requested data include fishing date, location, and information on catch and effort required for the calculation of catch per unit of effort statistics. Reports are to be made on a daily basis and can be made to Greenland Fisheries License Control Authority (GFLK) by email, phone, fax, return logbook or via an online reporting system (www.sullissivik.gl). 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.

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). 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. The Government of Greenland 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 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 programme to take samples of their catches upon request. The measure was applied to the 2018–2020 fisheries as the FWI indicated no significant change in the previously provided catch advice prior to the 2019 and 2020 fisheries. Given the 2019 fishery overharvest, the 2020 fishery quota was set to 20.7 t.

The 2020 fishery opened on September 1st. On September 17th, more than 15 t of landings had been registered and given landings projections the Government of Greenland announced the fishing season would end on September 20th. However, an approximate one week delay from landings to registration of landings resulted in the quota being exceeded by 11 t. The final reported harvest for the 2020 fishery was 31.7 t (including harvest in East Greenland).

5.1.1 Catch and effort in 2020

Catch data were collated from fisher reports. The reports were screened for errors and missing values by Greenlandic authorities. Catches were assigned to a NAFO/ICES Division based on the reporting community. If any reports only contained the total number of salmon caught or the total catch weight without the number of salmon, they 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 2020, a total catch of 31.7 t was reported (Table 5.1.1.1). Reported landings were distributed among the six NAFO Divisions (30.9 t) on the west coast of Greenland and in ICES Division XIV (0.8 t) on the east coast of Greenland (Table 5.1.1.2; Figure 5.1.1.1). As in previous years, the majority of the catch in 2020 was reported by commercial fishers for commercial purposes (Tables 5.1.1.3 and 5.1.1.4; Figure 5.1.1.2). The 2020 reported landings are a slight increase from the 2019 value (29.8 t) 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 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 37.9 t over the past ten years (2011–2020; Table 5.1.1.2; Figure 5.1.1.2).

There is currently no quantitative approach for estimating the unreported catch for the fishery, but the 2020 value is assumed to have been at the same level as reported by the Greenlandic authorities historically (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.

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)
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%)
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%)
2020	30.9 (97.5%)	0.8 (2.5%)	31.7	22.0 (69.5%)	0 (0%)	0 (0%)	9.7 (30.5%)

Detailed statistics on the registration of commercial landings for commercial and private use (Figure 5.1.1.2) are available from 1997 to the present. The mean percentage of commercial landings registered for private use from 1997–2017 was 41% (excluding 2000 and 2001) and 0.2% from 2018–2020. The Working Group was previously 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.

Greenland Authorities issued 757 licences (339 for commercial fishers and 418 for private fishers) and received 1321 reports from 618 fishers across all areas in 2020 (Tables 5.1.1.5 and 5.1.1.6; Figure 5.1.1.3). There was an increase of 37 commercial fishers and an increase of three private fishers receiving licences compared to 2019. The number of licences issued, the number of fishers who reported, and the number of reports received have increased greatly starting in 2018, 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.

Licences and Reporting						
	Licences Issued			Number of Fishers Reporting (%)		
	Commercial	Private	Total	Commercial	Private	Total
2018	329	457	786	235 (71.4%)	322 (70.5%)	557 (70.9%)
2019	302	415	717	276 (91.4%)	361 (87.0%)	637 (88.8%)
2020	339	418	757	277 (81.7%)	341 (81.6%)	618 (81.6%)

The Working Group notes the significant increase in catch reporting since 2018 (Table 5.1.1.6; Figure 5.1.1.3). Reporting by commercial fishers increased from an average of 30% from 2009–2017 to an average of 82% from 2018–2020. For private fishers, the number of fishers reporting increased from an average of 53 from 2009–2017 to 341 from 2018–2020 with an average reporting percentage (80%), equivalent to the commercial fishers during this same period. In spite of the large increase in the number of private fishers reporting, reporting landings for this segment only increased 3.08 t on average. The Working Group concludes that these types of analyses are important for refining the estimate of unreported catch used in the assessment models.

The seasonal distribution of catches has previously been reported to the Working Group (ICES, 2002), but since 2002 this has only occurred for the 2016 and 2017 fisheries (ICES, 2017; ICES 2018). 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)). Data available from 2020 verify this pattern and shows relatively stable landings (daily mean of 1.5 t) across the 20-day fishing season (Figure 5.1.1.4). A small amount of salmon (1.2 t; 3.6%) were caught after the fishing season, approximately half of which occurred within two days of the closure.

The Working Group has previously requested that detailed data beyond reported landings and licence related information by community and NAFO Divisions be made available to further characterize and assess the fishery beyond what has previously been presented. The Working Group has been informed that this level of detail was often lacking from commercial and private landing reports, but with the increased reporting requirements starting in 2018 is now becoming more available. Preliminary analysis of catch per unit (CPUE) showed that CPUE generally decreased from the south to the north. Estimates of CPUE for the 2020 fishing season ranged from approximately 15-20 kg of salmon per net in the south (NAFO Division 1E and 1F) to 3-6 kg of salmon per net in the north (NAFO Divisions 1A and 1B). Spatially and temporally explicit catch and effort data from all fishers could be used to develop a time-series of CPUE as a potential index of abundance of Atlantic salmon at Greenland.

5.1.2 Landings adjustments

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. Comparing the weight of salmon seen by the sampling teams and the corresponding community-specific reported landings for the entire fishing season has occurred annually since 2002. Phone surveys were conducted for a three-year period starting in 2015. When discrepancies are noted through either method, adjusted landings are added to the reported landings to provide landings for assessment. A summary of the reported landings, adjusted landings (sampling), adjusted landings (survey) and landings for assessment is presented in Table 5.1.2.1. Landings for assessment do not replace the official reported statistics (Tables 5.1.1.1 and 5.1.1.2).

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. The time-series of reported landings and subsequent adjusted landings (sampling) for 2002–2020 are presented in Table 5.1.2.2. In most years, 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. An evaluation of non-reporting of harvest was not possible in 2020 due to international samplers not being in Greenland given travel restrictions associated with the COVID-19 pandemic (see Section 5.2).

Phone surveys were conducted January-February 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, adjusted landings (survey) have been estimated. A phone survey was initiated in 2018 to assess the 2017 fishery, but only nine fishers were contacted. Given the small number of fishers contacted, no landings adjustments were estimated. Phone surveys have not been conducted since.

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 2019 PFA years (Figure 5.1.3.1). The most recent estimate of exploitation available is for the 2019 fishery as the 2020 exploitation rate estimates are dependent on the 2020 PFA estimates, which depend on 2021 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 2019 NAC exploitation rate was 6.0%, which was a decrease from the 2018 estimate (12.2%) and lower than the previous five-year mean (8.1%, 2014–2018). 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 39.1%. The 2019 Southern NEAC exploitation rate of 0.7% is approximate to the 2018 estimate (0.7%) and the previous five-year mean (0.8%, 2014–2018). The 2019 estimate remains one of the lowest in the time-series. Southern NEAC exploitation rate at Greenland peaked in 1975 at 32%. 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

A ‘Statement of Co-operation on the West Greenland Fishery Sampling Programme for 2020’ was agreed to by the Parties of the West Greenland Commission (WGC) of NASCO in June 2020. This outlined the arrangements for the international sampling programme to be undertaken, which would have involved international samplers traveling to Greenland to sample harvested Atlantic salmon as has occurred in the recent past. Given uncertainty of potential travel restrictions and safety concerns associated with the COVID-19 pandemic, a Contingency Sampling Plan Working Group was formed by the WGC to develop a “Plan B” in case international samplers were unable to travel to Greenland. The Working Group developed a Contingency Sampling Plan and on July 15 it was decided that the Contingency Sampling Plan would be implemented given the continued travel restrictions associated with the COVID-19 pandemic.

The Contingency Sampling Programme consisted of providing individual sampling kits to groups of potential samplers based in Greenland. Three groups of potential samplers were identified: Greenland Fisheries License Control Authority Wildlife Officers, Greenland Institute of Nature Resources (GINR) staff and individual fishers as part of a Citizen Science initiative.

Each sampling kit contained an instruction placard in Greenlandic and Danish, pre-labelled genetic vials pre-filled with RNALater for tissue preservation, pre-labelled scale envelopes for scale storage, a plastic tape measure to collect fork length, a pair of scissors for fin clip collection, a knife for scale collection and a pencil. Sample kits provided to the Wildlife Officers and GINR staff also contained a hanging scale to collect gutted or whole weight data.

The sampling kits were customized for each group:

Wildlife Officers

- Two sampling kits were provided.
- Each kit had enough supplies to collect 200 samples for a total of 400 samples.
- Kits were intended for Wildlife Officers working in the Sisimiut and Nuuk regions (Figure 5.1.1.1).

GINR staff

- Two sampling kits were provided.
- Each kit had enough supplies to collect 200 samples for a total of 400 samples.
- One kit was intended for sampling at the Nuuk market in coordination with market staff and one kit was available for GINR staff if they travelled to other communities and were able to take salmon samples.

Citizen Science

- 216 sampling kits were provided.
- Each kit had enough supplies to collect either five (540 samples) or 10 (1080 samples) for a total of 1620 samples.
- The kits were provided to the Municipal Offices in the following communities: Sisimiut (31 kits), Maniitsoq (54 kits), Nuuk (83 kits), Qaqortoq (36 kits) and Tasiilaq (12 kits). This amounted to enough kits to accommodate approximately half of the licences administered in 2019 for each community. The expectation was that each Municipal Office Administrator would describe the programme and offered each individual fisher the opportunity to voluntarily collect samples when they were picking up their fishing licence.

Supplies were provided to accommodate a maximum of 2420 samples. Prior to the fishing season, the Citizen Science effort was promoted by NASCO and the Government of Greenland via tweets, press releases, Facebook posts, etc. After the fishing season, all kits were to be returned to each Municipal Office or directly to the GINR and then onto the United States for data entry, auditing and sample distribution for processing.

Samples were collected from all three aspects of the Contingency Sampling Programme and from three NAFO divisions. The total number of salmon sampled was 114, of which 111 lengths, 75 scale samples and 113 tissue samples were collected (Table 5.2.1).

Contingency Sampling Programme results				
NAFO Division	Wildlife Officers	GINR	Citizen Science	Total
1D	9	57	18	84
1E	6	-	10	16
1F	11	-	3	14
Total	26	57	31	114

The low number of samples can be attributed to a number of different factors. A primary factor was that the fishing season was only 20 days, which reduced the amount of time that Wildlife Officers or GINR staff had to collect samples. Additionally, the Municipal Offices remained closed to the public due to the COVID-19 pandemic and fishing licences were delivered via email. As such, there was very little opportunity for individual fishers to learn about the Citizen Science initiative or be offered the opportunity to participate. There were other minor issues that can be mitigated for if a similar type sampling programme is undertaken in the future.

The samples were not received in time to allow for processing and therefore the results from the 114 samples were not available to the Working Group for consideration. The expectation is that the samples will be processed in 2021 and made available in the Working Group in 2022. Therefore, no information on the biological characteristics or continent or region of origin for the 2020 harvest. No internal or external tags were reported from the 2020 harvest either.

To mitigate for the lack of biological characteristics data and continent of origin estimates for the 2020 fishery, five-year mean values were used in the NAC and NEAC pre-fishery abundance run-reconstruction and forecast models (Sections 4.3, 4.4, 3.3 and 3.4). Five-year mean estimates were generated for individual fish whole weight (3.19 kg) to estimate the number of fish harvested, the proportion of 1SW fish (0.953 for NAC and 0.964 for NEAC) to allocate harvest to sea age, and the five-year average number of genetic samples by continent of origin divided by 15 to better represent the annual variation in the proportion NAC and NEAC.

5.2.1 Biological characteristics of the catches

No biological characteristic data are available for the 2020 fishery. Mean length and whole weight of North American and European salmon by sea age for 1969–2019 are reported in Table 5.2.1.1. The mean length and weight data reported have not been adjusted for the period of sampling and it is known that salmon grow quickly during this period of feeding while subjected to the fishery at West Greenland. Preliminary analyses to adjust for period of sampling have been previously reported (ICES, 2011; ICES, 2015) and therefore caution is urged when interpreting the uncorrected data. The distribution of river ages for North American and European origin salmon for the 1968–2019 fisheries are presented in Tables 5.2.1.2 and 5.2.1.3. The distribution of sea ages for North American and European origin salmon for the 1985–2019 fisheries are presented in Table 5.2.1.4.

5.2.2 Continent and region of origin of catches at West Greenland

No continent or region of origin data are available for the 2020 fishery. The time-series of estimated percent continent of origin and number of fish harvested by continent are presented in Table 5.2.2.1, and Figures 5.2.2.3 and 5.2.2.4. The number of North American and European Atlantic salmon harvested in 2020 was estimated using five-year averages of mean weight and the proportion of 1SW and continent of origin for NAC and NEAC as noted in Section 5.2. However, the estimated number of North American and European origin salmon harvested in 2020 (Figure 5.2.2.4) has not been weighted by the catch as in previous years (ICES 2020).

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 five of the seven stock complexes exploited at West Greenland were below CLs in 2020 (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 2020 increased by 50% from the 2019 revised estimate, and is the 15th highest on record (1971–2020; 50 years). The midpoints of the spawner abundance estimates were below the CLs for 5 of the 6 regions of NAC (Figure 4.3.2.4). The proportion of the 2SW CL attained from 2SW spawners was 85% for Labrador, 70% for Newfoundland, 78% for Québec, 161% for the Gulf region, and 4% and 5% (10% and 32% of the management objectives) for Scotia-Fundy and USA, respectively. The Gulf region is classified as at full reproductive capacity and the remaining regions are all suffering reduced reproductive capacity. Within each of the geographic areas, there are individual river stocks which are failing to meet CLs (Table 4.3.4.1; 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 approximately 80% in 1971 for 2SW salmon to a mean of 10% over the past ten years.

5.3.2 MSW Southern European stock complex

The lower bound of the 90% confidence limit of the spawner abundance estimate for the Southern NEAC MSW stock complex was above the CL and is therefore at full reproductive capacity (Figure 3.3.4.2). Individual countries stock status within the NEAC MSW stock complex varied across all three stock status designations (Figures 3.3.4.5 and 3.3.4.7). 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 3.3.5.2; 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 3% in 2020, which was lower than the previous five year (7%) and ten year (9%) means.

5.4 NASCO has requested ICES to provide catch options or alternative management advice for 2021–2023 with an assessment of risk relative to the objective of exceeding stock conservation limits, or predefined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding

The management advice for the West Greenland fishery for 2021 to 2023 is based on the models used by the Working Group since 2003 and most recently revised in ICES (2018). The Working Group followed the process developed in previous years for providing management advice and catch options for West Greenland using the PFA and CLs or alternate management objectives of the NAC and NEAC areas (Table 5.4.1). The risks of the Greenland fishery to NAC and NEAC stock complexes are developed in parallel and combined into a single catch options table (Table 5.4.2).

5.4.1 Catch options for West Greenland

None of the stated management objectives would allow a mixed-stock fishery at West Greenland to take place in 2021, 2022, or 2023.

- In the absence of any marine fishing mortality at Greenland and North America, the lowest probabilities that the returns of 2SW salmon to North America will be sufficient to meet the conservation requirements of any one of the four northern regions (Labrador, Newfoundland, Québec, and Gulf) were estimated to be 0.51, 0.44, and 0.30, all for the Newfoundland region for the years 2021, 2022, and 2023, respectively (Table 5.4.2).
- In the absence of any marine fishing mortality at Greenland and North America, there is a low probability (from 0.01 to 0.03) that the returns in the southern region of Scotia-Fundy will be sufficient to meet the stock rebuilding objective during the period 2021 to 2023 (Table 5.4.2). The probability of meeting or exceeding the stock rebuilding objective of the USA region is estimated at 0.11 to 0.23 over the three years.
- In the absence of any marine fishing mortality at Greenland and in NEAC, the probabilities of meeting or exceeding the SER for the Southern NEAC MSW complex is 0.93, 0.83, and 0.75 in 2021 to 2023, respectively (Table 5.4.2).
- In the absence of any fishing mortality on these stocks, there is a near zero probability (0.004 to 0.006) of meeting or exceeding the seven management objectives simultaneously in 2021 to 2023 (Table 5.4.2).

5.5 Relevant factors to be considered in management

The management of all fisheries should be based upon assessments of the status of individual stocks. Fisheries on mixed-stocks, particularly in coastal waters or on the high seas, pose particular difficulties for management as they target all stocks present, whether or not they are meeting their individual CLs. Conservation would be best achieved if fisheries target stocks that have been shown to be meeting CLs. Fisheries in estuaries and especially rivers are more likely to meet this requirement.

The salmon caught in the West Greenland fishery are mostly (>90%) non-maturing 1SW salmon, most of which are destined to return to homewaters in Europe or North America as 2SW fish. The primary European stocks contributing to the fishery in West Greenland are thought to originate in the southern MSW stock complex, although small numbers may also originate in northern Europe. Most MSW stocks in North America are thought to contribute to the fishery at West Greenland. Previous spawners, including salmon that spawned first as 1SW and 2SW salmon also contribute to the fishery, but in generally low (<5%) proportions (Table 5.2.1.4).

5.6 Pre-fishery abundance forecasts 2021, 2022, 2023

PFA forecasts for each area (NAC Section 4.4 and NEAC Section 3.4) were developed using a Bayesian framework. A random walk productivity parameter linking lagged spawners or lagged eggs to PFA was developed and applied in the most recent assessments (2018 for NAC and for NEAC; ICES, 2018). The PFA forecasts for the West Greenland stock complex although improved from the lowest value estimated in 2001 remain well below the values prior to 1992 (Figures 4.4.3.1.4 and 3.4.2.1).

5.6.1 North American stock complex

The PFANA forecasts for 2021 to 2023 fluctuate at median values of 208 150 (for 2023) to 217 000 fish (for 2022), and remain at low values relative to the earliest decade of the time-series (Table 4.4.3.1; Figure 4.4.3.1.4). The regional PFA forecasts indicate an increase during 2021 to 2023 for Labrador, Gulf, Scotia-Fundy and USA and an expected decrease or no change for Newfoundland and Québec (Figure 4.4.3.1.5).

5.6.2 Southern NEAC MSW stock complex

The Southern NEAC 1SW non-maturing (MSW) PFA forecasts for 2021 to 2023 fluctuate at median values between 422 285 and 565 442 fish, which are low relative to the earliest decade of the time-series (Figure 3.4.2.1). The median PFA for the Southern NEAC MSW complex is forecast to remain above the SER in 2021 to 2023 (Figure 3.4.2.1). The Southern NEAC SERs are substantially lower than last year's figures due to the implementation of new river-specific CLs for UK (Scotland), which accounts for approximately 50% of the Southern NEAC PFA (Section 3.3.4).

5.7 Comparison with previous assessment and advice

A detailed comparison with the previous assessment and advice is provided in Section 4.4.4. Updated and revised values of returns and spawners were obtained from run reconstruction for both NAC and NEAC time-series. For the 2020 assessment year, previous five-year mean values were used in a few regions of NAC because of the impact of the COVID-19 pandemic on field programmes. Similarly, previous five year mean values were used for the 2020 biological characteristics of salmon in the fishery at West Greenland, due to restrictions on travel of the sampling teams associated with the COVID-19 pandemic in 2020 (see Sections 2.3.1 and 5.2).

The 2SW CLs for Gulf and Québec were revised in 2019, with a slight increase for Québec (from 29 446 to 32 085 2SW fish) and a substantial decrease for Gulf (from 30 430 to 18 737 2SW fish). The Southern NEAC MSW CLs decreased as a result of the revision of CLs for UK (Scotland).

In 2018, the ICES Working Group provided forecasts of the regional productivity parameters and the regional specific PFAs based on the regional lagged spawners. The productivity parameter used for the 2018 to 2020 PFA years was negative for three regions (Gulf, Scotia-Fundy, USA), positive and at low values for Québec and Newfoundland, and high for Labrador (ICES 2018; Figure 4.4.4.1). Based on 2021 assessment, the realized productivity for the 2017 to 2019 PFA years was estimated to have been higher than predicted in most regions, except Labrador

(Figure 4.4.4.1). The estimated regional PFA values were lower in Labrador for the 2017 to 2019 PFA years and slightly higher in all the other regions however the larger overestimate for Labrador relative to the other regions resulted in lower PFA values for NAC overall. Due to the large uncertainty associated with the forecast values, the estimated PFA values for 2017 to 2019 were within the 95% confidence intervals of the forecast values.

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 and this year's assessment confirms that advice.

5.8 Critical examination of changes to the models used to provide catch options

5.8.1 Run-reconstruction models

The run-reconstruction models to estimate pre-fishery abundance of 1SW non-maturing and maturing 2SW fish adjusted by natural mortality to the time prior to the West Greenland fishery follow the same structure as used since 2003 (ICES, 2003; 2004; 2005; 2006; 2012; 2015; 2018). Additional details are provided in Sections 4.3.6 and 3.3.1.

5.8.2 Forecast models for pre-fishery abundance of 2SW salmon

The forecast models used to estimate pre-fishery abundance of non-maturing 1SW salmon (potential MSW) for North America and for the Southern NEAC MSW salmon were the same as those used in the previous assessment in 2018 for NAC and for Southern NEAC (ICES, 2018). For NAC, a regionally disaggregated model for 2SW salmon only was developed whereas a combined 1SW cohort model was developed and used for the Southern NEAC complex. Details of the model structures and the differences between these new models and those previously used by the Working Group are provided in the Annex 5 (Stock Annex).

5.8.3 Development and risk assessment of catch options

The provision of catch options in a risk framework involves incorporating the uncertainty in the factors used to develop the catch options. The ranges in the uncertainties of all the factors will result in assessments of differing levels of precision. The analysis of risk involves four steps: 1) identifying the sources of uncertainty; 2) describing the precision or imprecision of the assessment; 3) defining a management strategy; and 4) evaluating the probability of an event (either desirable or undesirable) resulting from the fishery action. Atlantic salmon are managed with the objective of achieving spawning conservation limits. The undesirable event to be assessed is that the spawning escapement after fisheries will be below the conservation limit.

The risk assessments for the two stock complexes in the West Greenland fishery are developed in parallel and then combined at the end of the process into a single summary plot or catch options table (see Annex 5 for details; Figure 5.8.3.1).

5.8.4 Critical evaluation

Changes to the run-reconstruction and pre-fishery abundance forecast models have been critically examined in ICES (2009; 2011). There were no changes to the risk assessment of the catch options model. The Working Group used models that are fitted and forecasts derived in a single consistent Bayesian framework.

5.9 NASCO has requested ICES to update the Framework of Indicators used to identify any significant change in the previously provided multiannual management advice

In 2007, ICES developed and presented to NASCO a framework (Framework of Indicators, FWI) to be used in interim years to determine if there is an expectation that the previously provided multi-year management advice for the Greenland fishery is likely to change in subsequent years (ICES, 2007). A significant change in management advice would be an unforeseen increase in stock abundance to a level that would allow a fishery in the case where no catch had been previously advised, or a decrease in stock abundance when catch options had been chosen. The finalized Framework of Indicators was accepted by NASCO in June 2007, and applied to the 2008 fishery at West Greenland. The FWI was updated in 2009 (ICES, 2009), in 2012 (ICES, 2012), in 2015 (ICES, 2015) and again in 2018 (ICES, 2018) in support of multi-annual regulatory measures for the West Greenland fishery during the time periods 2009–2011, 2012–2014, 2015–2017 and 2018–2020. An updated FWI has been requested by NASCO in support of the multiyear catch advice and the potential approval of multi-year regulatory measures for the 2021–2023 fisheries. A full description of the development of the FWI and instructions for the application of the framework indicator spreadsheet are detailed in Annex 5.

5.9.1 Update of the Framework of Indicators

The Working Group updated the FWI in support of the West Greenland fishery management. The update consisted of:

- Adding the values of the indicator variables for the most recent years;
- Running the objective function spreadsheet for each indicator variable and the variable of interest relative to the management objectives;
- Quantifying the threshold value for the indicator variables and the probabilities of a true high state and a true low state for those indicator variables retained for the framework;
- Revising/adding the indicator variables and the functions for evaluating the indicator score to the framework spreadsheet; and
- Providing the spreadsheet for doing the framework of indicators assessment.

The management objectives for the development of the catch options for the West Greenland fishery are provided in Table 5.4.1. Based on the results from the objective function spreadsheet and the criteria established by the Working Group, a total of 19 indicator variables, represented by 13 different rivers, were retained (Table 5.9.1.1; Figure 5.9.1.1). Of these, two were survival rate indicators, while the remainder were of 2SW and large salmon (n=13) or wild 1SW and small salmon (n=4) returns to rivers.

Origin	Wild	Wild	Wild	Wild	Hatchery	Hatchery	
Type of data	Return	Return	Survival	Survival	Survival	Survival	
Size/age group	Small/1SW	Large/2SW/ MSW	Small/1SW	Large/2SW	Small/1SW	Large/2SW	Total
Labrador							0
Newfoundland							0
Québec	1	8		1			10
Gulf	1	1					2
Scotia-Fundy	2	3					5
USA		11				1	2
Total	4	13		1		1	19

[1] for USA, returns include both wild and hatchery origin fish.

Summaries of the indicator variables retained for the potential 2021 to 2023 multiyear catch advice indicator framework are provided in Table 5.9.1.1. No indicator variables were retained for the Labrador, Newfoundland and Southern NEAC areas. All the retained indicator variables had a probability of identifying a true low state or a true high state of at least 80% (Figure 5.9.1.2).

Table 5.1.1.1. Nominal catches of salmon at West Greenland since 1960 (tonnes, round fresh weight) by participating nations. For Greenlandic vessels specifically, all catches up to 1968 were taken with set gillnets only, catches from 1968–2019 were taken with set gillnets and driftnets and catches from 2020 to the present were taken with set gillnets. All non-Greenlandic vessel catches from 1969 to 1975 were harvested 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 catch 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	

Year	Nor-way	Fa-roes	Swe-den	Den-mark	Green-land	Total	Quota	Comments
1984	-	-	-	-	297	297	870	
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%.
1989	-	-	-	-	337	337	900	Quota adjusted to 900 t for later opening date.
1990	-	-	-	-	274	274	924	Quota adjusted to 924 t for later opening date.
1991	-	-	-	-	472	472	840	
1992	-	-	-	-	237	237	258	
1993	-	-	-	-			89	The fishery was suspended. NASCO adopt a new quota allocation model.
1994	-	-	-	-			137	The fishery was suspended and the quota was bought out.
1995	-	-	-	-	83	83	77	
1996	-	-	-	-	92	92	174	
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	Same as previous year.
2000	-	-	-	-	21	21	20	Same as previous year.
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).
2003	-	-	-	-	9	9		Quota set to nil (no factory landing allowed), fishery restricted to catches used for internal consumption in Greenland.
2004	-	-	-	-	15	15		Same as previous year.
2005	-	-	-	-	15	15		Same as previous year.

Year	Nor-way	Fa-roes	Swe-den	Den-mark	Green-land	Total	Quota	Comments
2006	-	-	-	-	22	22		Same as previous year.
2007	-	-	-	-	25	25		Same as previous year.
2008	-	-	-	-	26	26		Same as previous year.
2009	-	-	-	-	26	26		Same as previous year.
2010	-	-	-	-	40	40		Same as previous year.
2011	-	-	-	-	28	28		Same as previous year.
2012	-	-	-	-	33	33	(35)	35 t quota for factory landings only.
2013	-	-	-	-	47	47	(35)	Same as previous year.
2014	-	-	-	-	58	58	(30)	Quota for factory landings only.
2015	-	-	-	-	57	57	45	Quota for all sectors (private and commercial) of the fishery.
2016	-	-	-	-	27	27	32	Same as previous year.
2017	-	-	-	-	28	28	45	Same as previous year.
2018	-	-	-	-	40	40	30	Same as previous year.
2019	-	-	-	-	30	30	19.5	Same as previous year.
2020	-	-	-	-	32	32	21	Same as previous year.

Table 5.1.1.2. Annual 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	-	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
2020	0.9	3.6	6.6	9.7	3.0	7.1	0	30.9	0.8	31.7

[1] The fishery was suspended.

+ Small catches <0.5 t.

- No reported 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 2020. 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	41	58		0.2		0.2
1A	Commercial	59	120	0.7			0.7
1A	TOTAL	100	178	0.7	0.2		0.9
1B	Private	42	92		0.5		0.5
1B	Commercial	47	147	3.1			3.1
1B	TOTAL	89	239	3.1	0.5		3.6
1C	Private	28	47		0.8		0.8
1C	Commercial	75	181	5.8			5.8
1C	TOTAL	103	228	5.8	0.8		6.6
1D	Private	116	171		2.8		2.8
1D	Commercial	35	102	7.0			7.0
1D	TOTAL	151	273	7.0	2.8		9.7
1E	Private	27	47		1.1		1.1
1E	Commercial	20	44	1.9			1.9
1E	TOTAL	47	91	1.9	1.1		3.0
1F	Private	79	191		3.9		3.9
1F	Commercial	39	93	3.2			3.2
1F	TOTAL	118	284	3.2	3.9		7.1
XIV	Private	8	23		0.5		0.5
XIV	Commercial	2	5	0.3			0.3
XIV	TOTAL	10	28	0.3	0.5		0.8
ALL	Private	341	629		9.7		9.7
ALL	Commercial	277	692	22.0			22.0
ALL	TOTAL	618	1321	22.0	9.7		31.7

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 2018 and 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	Licence Type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total
	2019							2018						
1A	Private	42	60		0.1		0.1	Private	35	58	0.0	0.2		0.2
1A	Commercial	54	105	0.7			0.7	Commercial	63	177	2.2	0.0		2.2
1A	TOTAL	96	165	0.7	0.1		0.8	TOTAL	98	235	2.2	0.2		2.4
1B	Private	35	62	0	0.4		0.5	Private	47	105		1.0		1.0
1B	Commercial	34	126	2.5	0		2.6	Commercial	31	125	4.6			4.6
1B	TOTAL	70	191	2.6	0.4		3.0	TOTAL	78	230	4.6	1.0		5.7
1C	Private	29	40	0	0.2		0.3	Private	25	51		0.8		0.8
1C	Commercial	88	176	4.0	0		4.0	Commercial	56	200	12.9			12.9
1C	TOTAL	117	216	4.1	0.3		4.4	TOTAL	81	251	12.9	0.8		13.7
1D	Private	136	176	0.0	1.2		1.3	Private	125	163	0.0	1.4		1.4
1D	Commercial	33	98	6.7	0		6.8	Commercial	18	120	6.8			6.8
1D	TOTAL	169	274	6.8	1.2		8.0	TOTAL	143	283	6.8	1.4		8.2
1E	Private	31	106		2.0		2.0	Private	20	86		1.5		1.5
1E	Commercial	23	110	2.8	0.0		2.9	Commercial	24	98	2.7	0.1		2.8
1E	TOTAL	54	216	2.8	2.0		4.8	TOTAL	44	184	2.7	1.6		4.2

NAFO/ICES	Licence Type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total	Licence Type	No. of Fishers	No. of Reports	Comm.	Private	Factory	Total
1F	Private	70	228	0.0	2.8		2.9	Private	65	169		2.0		2.0
1F	Commercial	38	145	4.5			4.5	Commercial	40	130	2.8			2.8
1F	TOTAL	108	373	4.5	2.8		7.3	TOTAL	105	299	2.8	2.0		4.8
XIV	Private	18	65		1.0		1.0	Private	5	42		0.4		0.4
XIV	Commercial	6	31	0.5			0.5	Commercial	3	12	0.4			0.4
XIV	TOTAL	24	96	0.5	1.0		1.4	TOTAL	8	54	0.4	0.4		0.8
ALL	Private	361	737	0.2	7.6		7.9	Private	322	674	0.0	7.2		7.3
ALL	Commercial	276	791	21.8	0.1		21.9	Commercial	235	862	32.5	0.1		32.6
ALL	TOTAL	638	1531	22.0	7.7		29.8	TOTAL	557	1536	32.5	7.4		39.9

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	Li-cences	1A	1B	1C	1D	1E	1F	ICES	Unk.	Number of fishers reporting	Number of reports re-ceived
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
2020	757	100	89	103	151	47	118	10	0	618	1321

Table 5.1.1.6. Total number of licences issued, number and percent of people reporting catches and reported catch by fisher type in the Greenland Atlantic salmon fishery 1987-present. Average values for different time periods are also provided for comparison. Prior to 2018, only commercial fishers were required to have a licence.

	Commercial Fishers				**Private Fishers**				**Total**		
Year	No. Licences	No. reporting	%	Catch (kg)	No. Licences	No. reporting	%	Catch (kg)	No. Licences	No. reporting	Catch (kg)
1987										579	
1988										516	
1989										393	
1990										362	
1991										410	
1992										212	
1993											
1994											
1995										145	
1996										163	
1997		185								185	59 333
1998	405	46	11%	7463		24				70	11 059
1999	424	110	26%	15 551						110	19 464
2000	179	45	25%	19 900		1				46	20 504
2001	451	57	13%	34 184		30				87	42 514
2002	480	24	5%	5753		19				43	8119
2003	150	23	15%	6008		19				42	8694
2004	157	32	20%	11 342		32				64	15 945
2005	185	55	30%	7133		20				75	13 788
2006	166	69	42%	12 023		67				136	20 836
2007	261	102	39%	14 919		28				130	22 204
2008	262	78	30%	11 303		173				251	26 000
2009	293	100	34%	21 955		45				145	26 278
2010	309	110	36%	27 332		98				208	39 696
2011	242	61	25%	21 397		56				117	27 524
2012	276	79	29%	29 056		43				122	33 178

	Commercial Fishers				**Private Fishers**				**Total**		
Year	No. Licences	No. reporting	%	Catch (kg)	No. Licences	No. reporting	%	Catch (kg)	No. Licences	No. reporting	Catch (kg)
2013	328	66	20%	45 600		29				95	46 961
2014	320	98	31%	56 246		16				114	57 836
2015	310	114	37%	50 841		75				189	56 847
2016	263	71	27%	19 395		69				140	27 120
2017	282	93	33%	24 919		50				143	28 042
2018	329	235	71%	32 597	457	322	70%	7268	786	557	39 865
2019	302	276	91%	21 869	415	361	87%	7879	717	637	29 769
2020	339	277	82%	22 000	418	341	82%	9669	757	618	31 670
Ave 1998–2008	284	58	23%	13 234		41				96	19 012
Ave 2009–2017	291	88	30%	32 971		53				141	38 165
Ave 2018–2020	323	263	82%	25 489	430	341	80%	8272	753	604	33 768

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
2020	30.9	-	-	30.9

Table 5.1.2.2. 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, and 2018-2020 as the sampling teams did not observe more fish than were reported. Shaded cells indicate that sampling took place in that year and division. No sampling data were available for comparison in 2020 due to travel restrictions associated with the COVID-19 pandemic.

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

Year	Type	1A	1B	1C	1D	1E	1F	Total
2015	Reported	751	8801	10 055	17 966	4170	14 134	55 877
	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							
2020	Reported	894	3612	6568	9727	3017	7085	30 903
	Adjusted							

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. Continent of origin assignments are not available for 2020.

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)
	1991	5005	1347		65	(69, 61)	35	(39, 31)

Source	Year	Sample Size			Continent of Origin (%)			
		Length	Scales	Genetics	North American	(95% CI)[1]	European	(95% CI)[1]
	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	
	2020	111	75	113	na		na	

[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 5.2.1.1. 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 weights and fork length by sea age and continent of origin are not available for 2020.

	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
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

	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
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
2020	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Prev. 10-yr mean	3.25	3.10	6.98	5.32	4.34	4.69	3.33	3.18	3.29	65.5	64.3	82.2	75.6	73.5	72.7
Over-all 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. River age distributions for North American origin salmon are not available for 2020.

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

Year	1	2	3	4	5	6	7	8
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
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

Year	1	2	3	4	5	6	7	8
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
2020	na	na	na	na	na	na	na	na
Previous 10-yr mean	0.5	28.7	41.1	22.0	7.2	0.6	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. River age distributions for European origin salmon are not available for 2020.

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
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

Year	1	2	3	4	5	6	7	8
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
2020	na	na	na	na	na	na	na	na
Previous 10-yr mean	9.1	61.5	25.1	4.0	0.3	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. Sea age distributions by continent of origin are not available for 2020.

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
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

Year	North American			European		
	1SW	2SW	Previous Spawners	1SW	2SW	Previous Spawners
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
2020	na	na	na	na	na	na
Previous 10-yr mean	94.8	1.2	4.1	95.3	3.5	1.2
Overall Mean	95.3	2.0	2.7	96.7	2.5	0.8

Table 5.2.2.1. 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. Estimated percentage and numbers of North American and European Atlantic salmon are not available for 2020.

	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
2008	86	14	8000	1300
2009	89	11	7000	800

	Percentage by continent weighted by catch		Numbers of salmon by continent	
Year	NA	E	NA	E
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
2020	na	na	na	na

Table 5.4.1. Management objectives and equivalent number of fish relevant to the development of catch options at West Greenland for the six geographic areas in NAC and the Southern NEAC non-maturing complex.

Area	Objective	Number of fish
US	2SW proportion of recovery criteria	4549
Scotia-Fundy	25% increase from 2SW returns during 1992 to 1997	10 976
Gulf	2SW conservation limit	18 737
Québec	2SW conservation limit	32 085
Newfoundland	2SW conservation limit	4022
Labrador	2SW conservation limit	34 746
Southern NEAC non-maturing complex	MSW conservation limit	174 735
	(Spawner escapement reserve to Jan. 1 of first winter at sea)	295 582

Table 5.4.2. Catch options tables for the mixed-stock fishery at West Greenland by year of PFA, 2021 to 2023. For the Simultaneous achievement, 0 refers to null attainment out of 5000 draws.

	Probability of meeting or exceeding region-specific management objectives							
	Labrador	Newfoundland	Québec	Gulf	Scotia-Fundy	US	Southern NEAC	Simultaneous
2021 Catch options								
0	0.75	0.51	0.60	0.92	0.01	0.11	0.93	0.004
10	0.73	0.49	0.58	0.91	0.01	0.10	0.93	0.004
20	0.72	0.47	0.55	0.90	0.01	0.10	0.93	0.004
30	0.70	0.45	0.52	0.88	0.01	0.09	0.92	0.004
40	0.68	0.44	0.50	0.87	0.01	0.09	0.92	0.004
50	0.67	0.42	0.47	0.86	0.01	0.08	0.92	0.003
60	0.65	0.40	0.45	0.84	0.01	0.08	0.92	0.003
70	0.63	0.38	0.42	0.83	0.01	0.08	0.92	0.003
80	0.61	0.36	0.40	0.81	0.01	0.07	0.91	0.003
90	0.59	0.34	0.37	0.79	0.01	0.07	0.91	0.003
100	0.57	0.32	0.35	0.77	0.01	0.07	0.91	0.003
2022 Catch options								
0	0.73	0.44	0.47	0.90	0.03	0.15	0.83	0.006
10	0.72	0.42	0.44	0.88	0.03	0.15	0.82	0.006
20	0.70	0.40	0.42	0.87	0.03	0.15	0.82	0.005
30	0.68	0.39	0.40	0.86	0.03	0.14	0.81	0.004
40	0.67	0.37	0.38	0.85	0.03	0.14	0.81	0.004
50	0.65	0.35	0.37	0.83	0.03	0.13	0.81	0.004
60	0.63	0.34	0.35	0.82	0.03	0.13	0.80	0.004
70	0.62	0.32	0.33	0.80	0.02	0.12	0.80	0.004
80	0.60	0.31	0.31	0.78	0.02	0.12	0.79	0.004
90	0.58	0.29	0.30	0.76	0.02	0.12	0.79	0.004
100	0.57	0.28	0.28	0.74	0.02	0.11	0.78	0.004
2020 Catch options								
0	0.67	0.30	0.46	0.83	0.03	0.23	0.75	0.005
10	0.66	0.28	0.44	0.82	0.03	0.22	0.74	0.005
20	0.64	0.27	0.43	0.80	0.03	0.22	0.74	0.005
30	0.63	0.26	0.41	0.79	0.03	0.21	0.74	0.005
40	0.61	0.25	0.39	0.77	0.03	0.21	0.73	0.005
50	0.60	0.24	0.37	0.76	0.02	0.20	0.73	0.004
60	0.58	0.23	0.35	0.73	0.02	0.19	0.72	0.004
70	0.56	0.22	0.34	0.72	0.02	0.19	0.72	0.004
80	0.55	0.20	0.32	0.70	0.02	0.18	0.71	0.004
90	0.53	0.19	0.30	0.69	0.02	0.18	0.71	0.004
100	0.51	0.18	0.29	0.67	0.02	0.17	0.70	0.003

Table 5.9.1.1. Indicator variables retained from the North American geographic area. First year of PFA and end year of PFA refer to the start and end years of the indicator variable scaled to a common life stage (the PFA equals smolt year + 1). Number of years refers to the number of usable observations. All indicators with a true low or a true high ≥80% were incorporated into the framework.

Type	Origin	Age group	Area	River	Unit	PFA start year	PFA end year	Number of years	2020 value*	Threshold	Indicator low (true low)	Indicator high (true high)
Return	W & H	2SW	USA	Penobscott	Number	1970	2019	50	998	2 167	1	1
Survival	H	2SW	USA	Penobscott	%	1970	2019	50	0.002	0.011	1	0.60
Return	W	Large	SF	Saint John	Number	1969	2019	51	115	3329	0.97	1
Return	W	Large	SF	LaHave	Number	1972	2018	47	22	285	0.82	0.85
Return	W	Large	SF	North	Number	1983	2019	36	226	626	0.96	0.75
Return	W	Small	SF	Saint John	Number	1970	2019	51	241	2276	0.90	0.80
Return	W	Small	SF	LaHave	Number	1979	2019	41	278	1679	0.96	0.67
Return	W	2SW	Gulf	Miramichi	Number	1970	2018	49	4746	8 366	1	0.98
Return	W	1SW	Gulf	Miramichi	Number	1971	2019	49	8792	41588	0.58	0.92
Return	W	Large	Québec	Bonaventure	Number	1983	2019	37	1531	2243	0.73	1
Return	W	Large	Québec	Grande Rivière	Number	1983	2019	37	426	442	1	0.83
Return	W	Large	Québec	Saint-Jean	Number	1983	2019	37	814	1013	0.79	1
Return	W	Large	Québec	Dartmouth	Number	1983	2019	37	889	756	0.86	0.75
Return	W	Large	Québec	Madeleine	Number	1983	2019	37	922	672	0.94	0.74
Return	W	Large	Québec	Sainte-Anne	Number	1983	2019	37	780	584	0.82	0.60
Return	W	Large	Québec	Mitis	Number	1983	2019	37	873	369	0.89	0.50
Return	W	Large	Québec	de la Trinité	Number	1983	2019	37	113	385	0.88	1
Return	W	Small	Québec	de la Trinité	Number	1979	2019	41	150	578	0.90	0.85
Survival	W	2SW	Québec	de la Trinité	%	1985	2019	34	0.28	0.49	1	0.68

*** 2020 value: or if not available, the latest value of the time-series.**

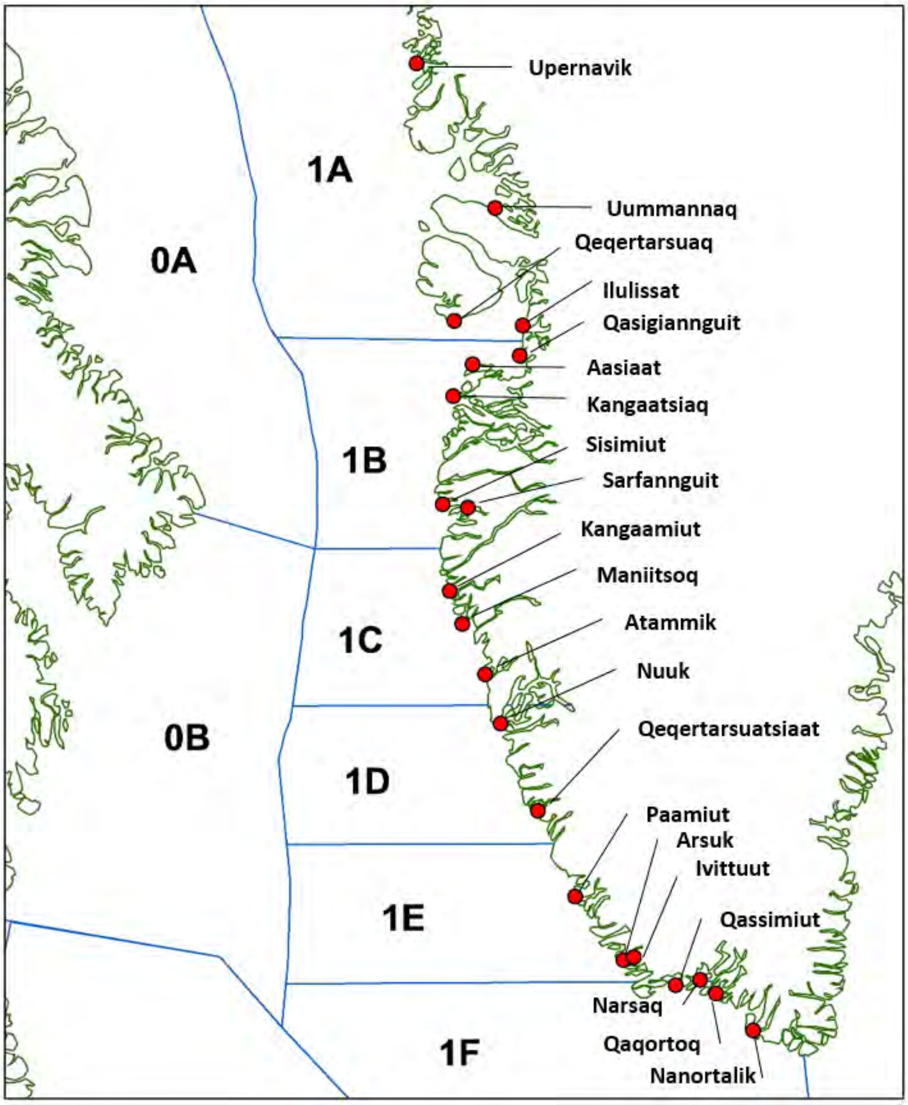
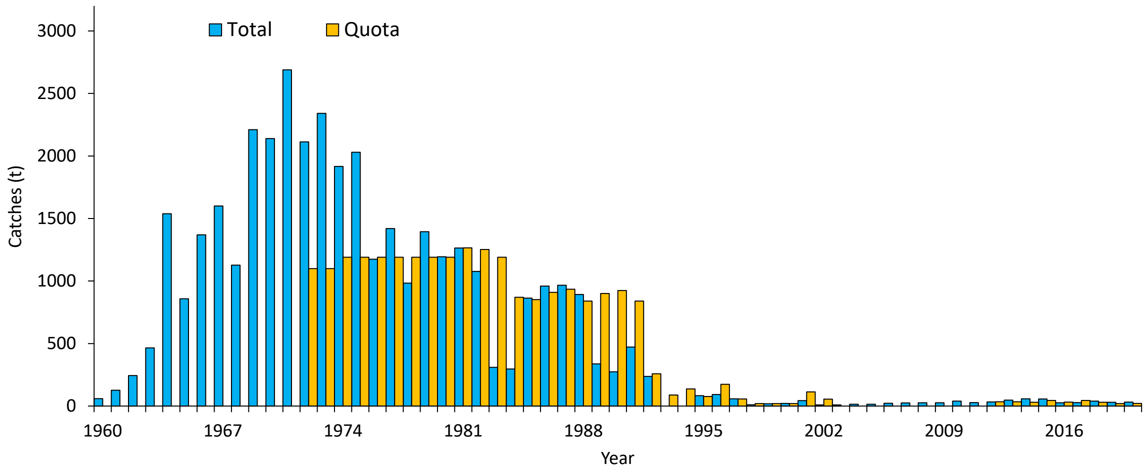


Figure 5.1.1.1. Map of southwest Greenland showing communities to which Atlantic salmon have historically been landed and corresponding NAFO divisions.



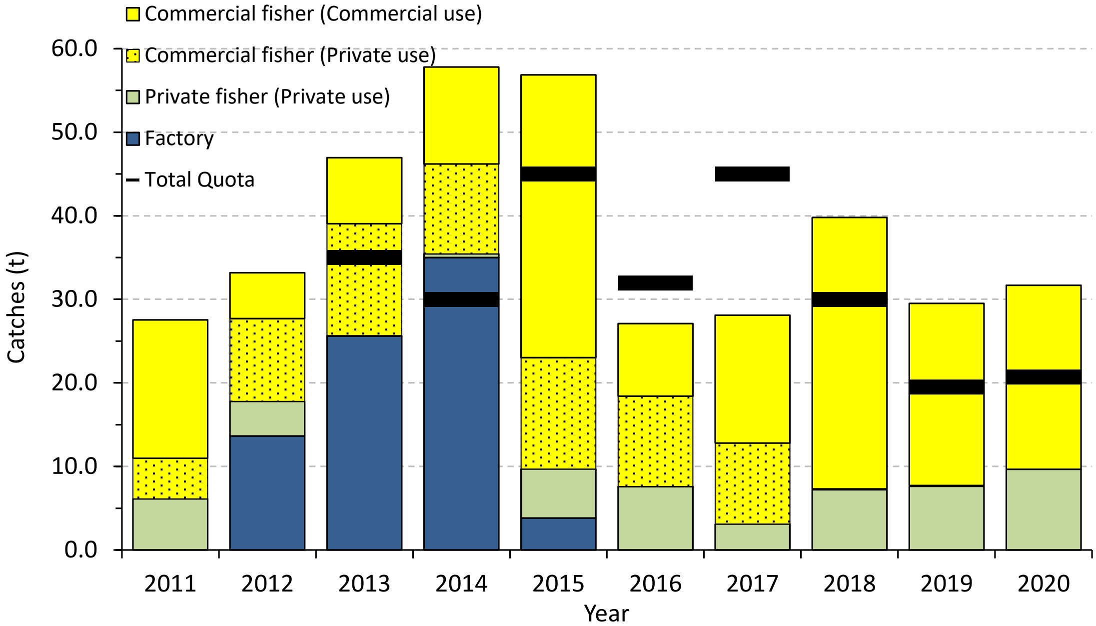


Figure 5.1.1.2. Nominal catches and commercial quotas (t, round fresh weight) of salmon at West Greenland for 1960–2020 (top panel) and 2011–2020 (bottom panel). Total reported landings from 2011–2020 are displayed by landings type. No quotas were set from 2002–2011, a factory only quota was set from 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 2015 and set to 45 t in 2017. A quota of 30 t was set in 2018, reduced to 19.5 t in 2019 to account for overharvest in 2018 and reduced to 20.7 in 2020 to account for overharvest in 2019. All fishers are required to have a licence to fish for Atlantic salmon starting in 2018.

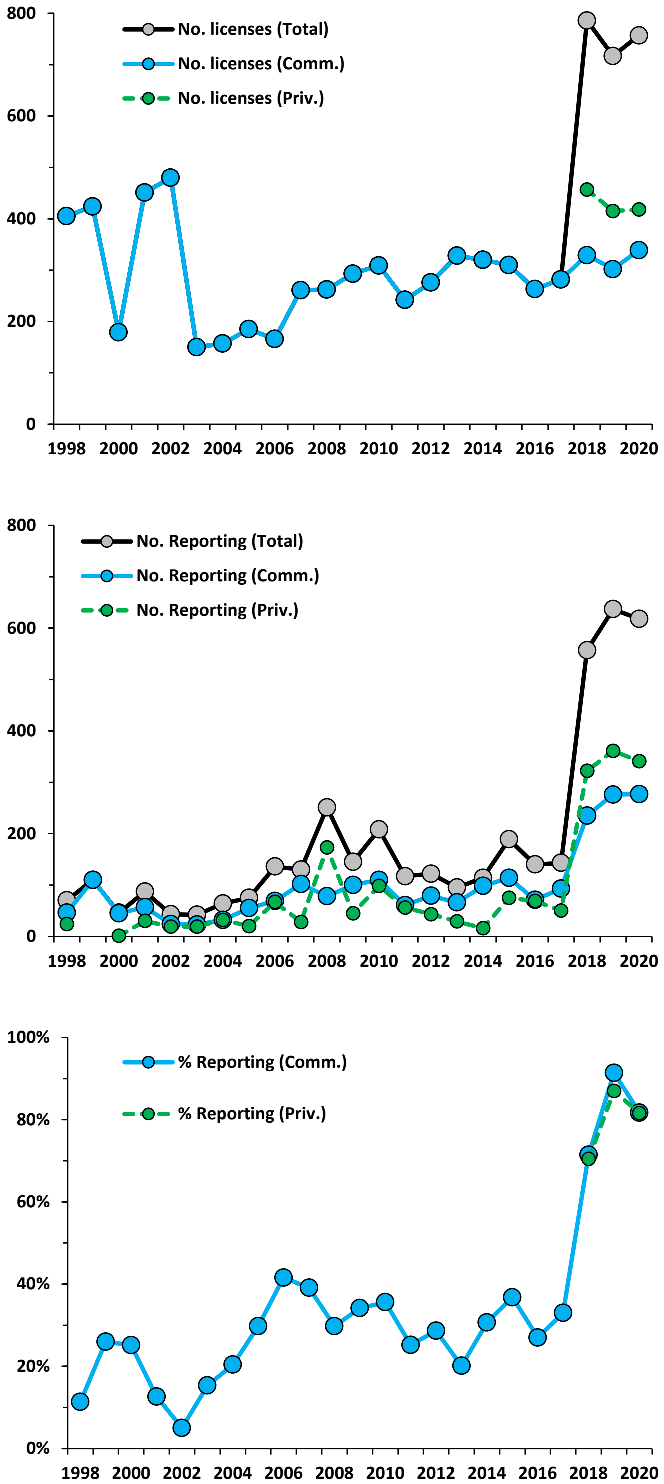
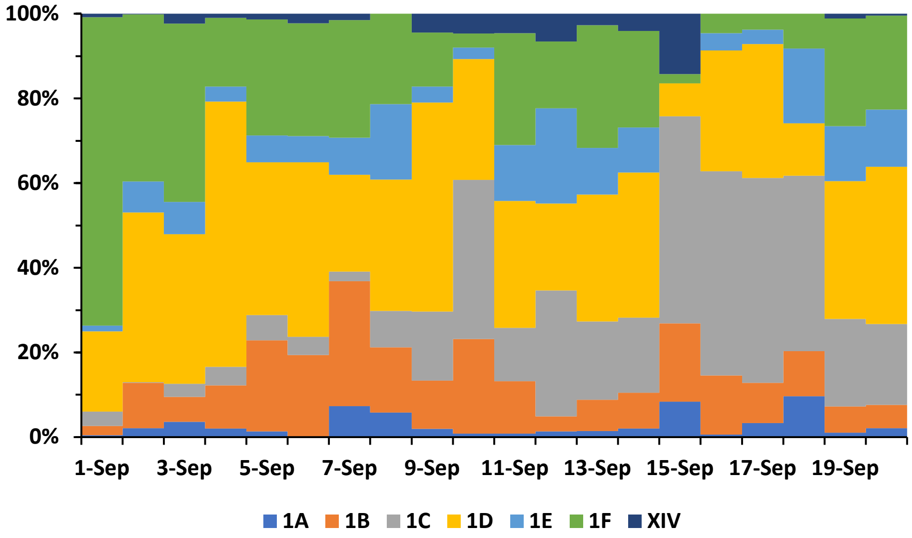


Figure 5.1.1.3. Number of licences issued by license type (top), number of fishers reporting by license type (middle) and percent of licensed fishers reporting by license type (bottom). Detailed statistics are available from 1998 to the present. Starting in 2018 all fishers were required to have a licence.



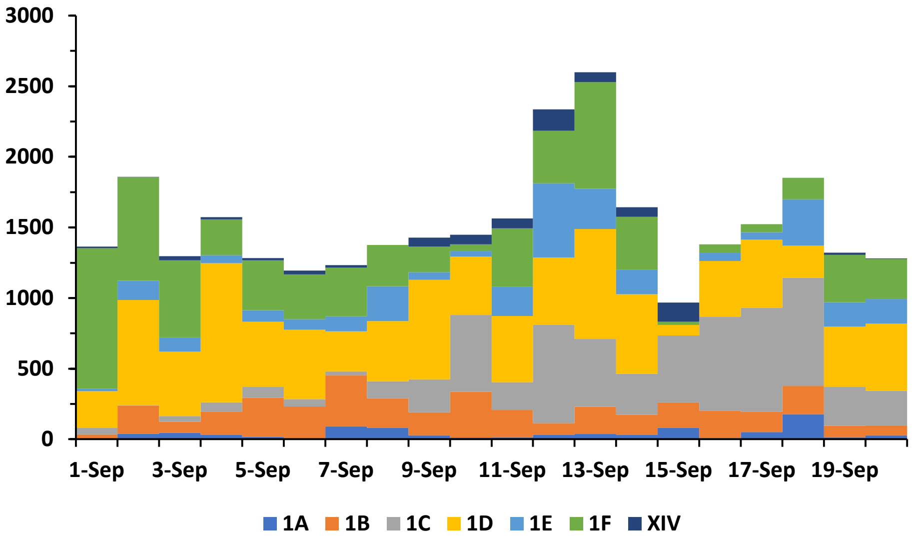
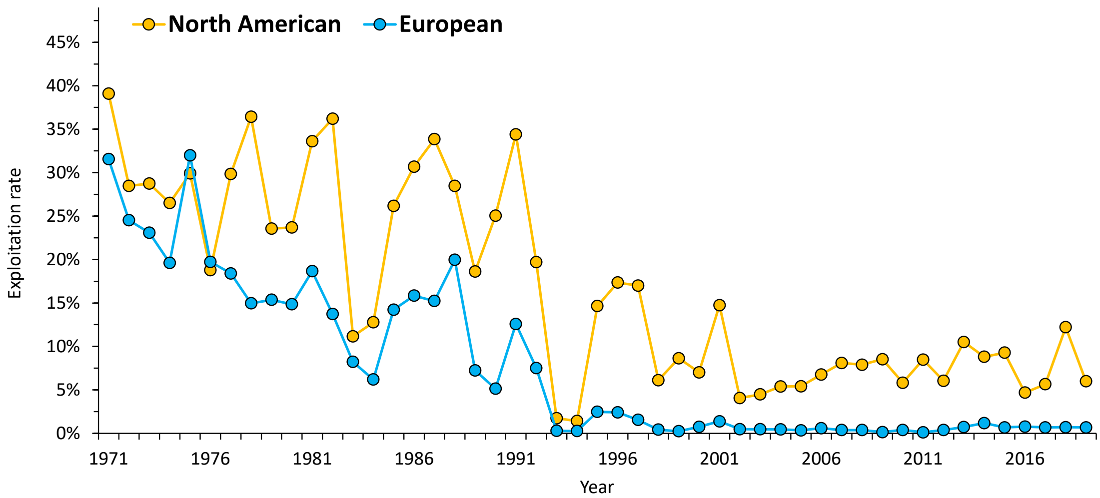


Figure 5.1.1.4. Summary of landings as a proportion of daily catch (top) and reported kilograms of landings by landings day (bottom) and NAFO Division/ICES statistical area for the 2020 Greenland Atlantic salmon fishery.



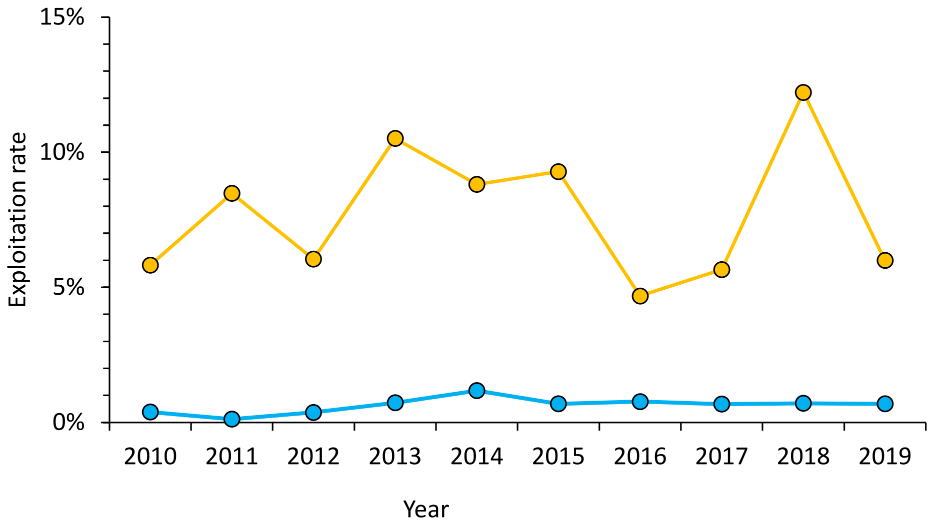


Figure 5.1.3.1. Exploitation rate (%) for NAC 1SW non-maturing and Southern NEAC non-maturing Atlantic salmon at West Greenland, 1971–2019 (top) and 2010–2019 (bottom). Exploitation rate estimates are only available to 2019, as 2020 exploitation rates are dependent on 2021 returns. Unreported catch is included.

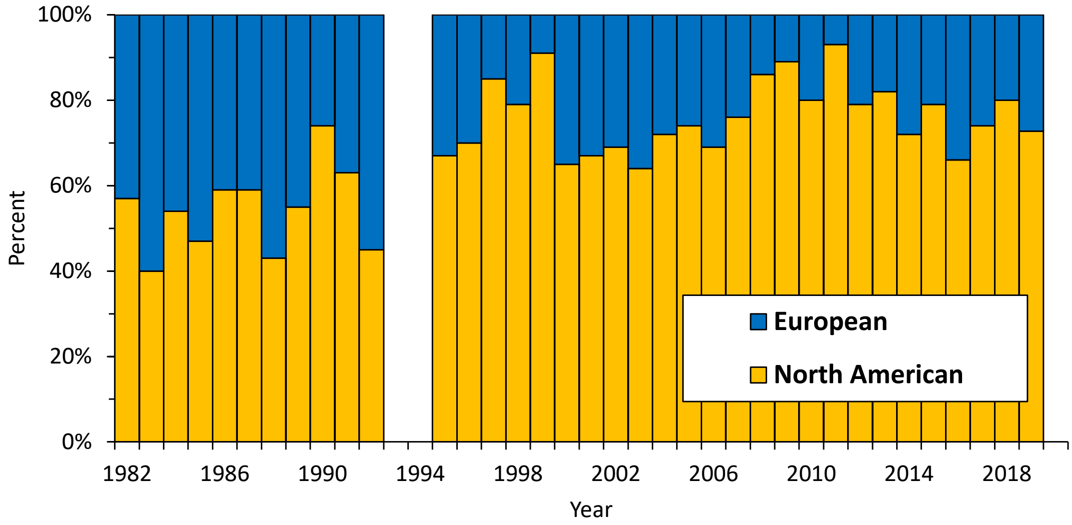


Figure 5.2.2.3. Percent of the sampled catch by continent of origin for 1982 to the present. Percent of the sampled catch by continent of origin is not available for 2020.

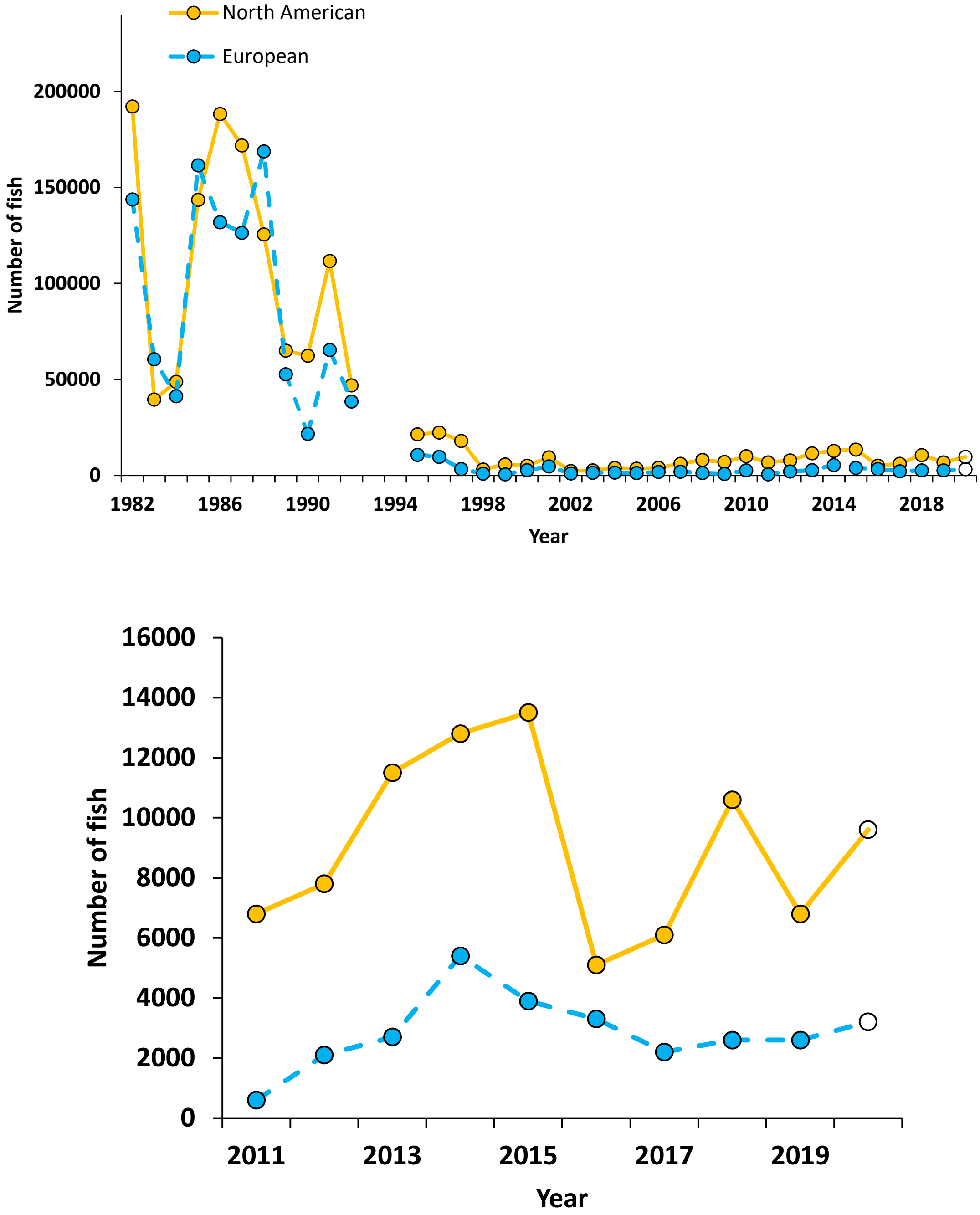


Figure 5.2.2.4. Number of North American and European Atlantic salmon caught at West Greenland from 1982–2020 (top) and 2011–2020 (bottom). Estimates are based on continent of origin by NAFO division, weighted by catch (weight) in each division. Numbers are rounded to the nearest hundred fish. Unreported catch not included. Given a lack of sample data from the 2020 fishery, the number of North American and European Atlantic salmon caught in 2020 was estimated using five-year averages of mean weight and the proportion of 1SW and continent of origin for NAC and NEAC. The 2020 estimate was not weighted by the catch.

Figure 5.3.1. Summary 2SW (NAC regions) and MSW (Southern NEAC) 2020 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).

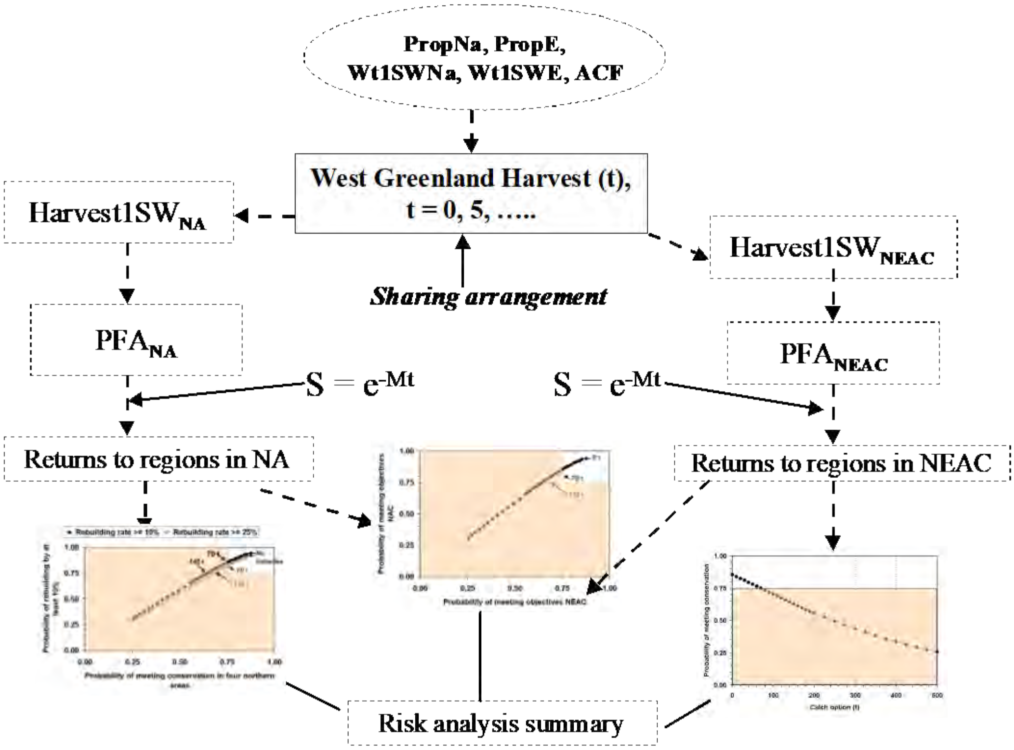


Figure 5.8.3.1. Flowchart, risk analysis for catch options at West Greenland using the PFANA and the PFANEAC predictions for the year of the fishery. Inputs with solid borders are considered known without error. Estimated inputs with observation error that are incorporated in the analysis have dashed borders. Solid arrows are functions that introduce or transfer without error whereas dashed arrows transfer errors through the components.

Catch Advice	Catch option > 0 (Yes = 1, No = 0)

Overall Recommendation

No Significant Change Identified by Indicators

Geographic Area	River/ Indicator	2020 Value*	Ratio Value to Threshold	Threshold	True Low	True High	Indicator State	Probability of Correct Assignment	Indicator Score	Management Objective Met?
USA	Penobscot 2SW Returns	998	46%	2 167	100%	100%	-1	1,00	-1,00	
	Penobscot 2SW Survival (%)	0,002	18%	0,011	100%	60%	-1	1,00	-1,00	
	possible range				*-1,00*	*0,80*				
	Average		32%						**-1,00**	**No**
Scotia-Fundy	Saint John Return Large	115	3%	3 329	97%	100%	-1	0,97	-0,97	
	Lahave Return Large	22	8%	285	82%	85%	-1	0,82	-0,82	
	North Return Large	226	36%	626	96%	75%	-1	0,96	-0,96	
	Saint John Return Small	241	11%	2 276	90%	80%	-1	0,90	-0,90	
	LaHave Return Small	278	17%	1 679	96%	67%	-1	0,96	-0,96	
	possible range				*-0,92*	*0,81*				
	Average		15%						**-0,92**	**No**
Gulf	Miramichi Return 2SW	4746	57%	8 366	100%	98%	-1	1,00	-1,00	
	Miramichi Return 1SW	8792	36%	24 287	58%	92%	-1	0,58	-0,58	
	possible range				*-0,79*	*0,95*				
	Average		46%						**-0,79**	**No**
Quebec	Bonaventure Return Large	1531	68%	2 243	73%	100%	-1	0,73	-0,73	
	Grande Rivière Return Large	426	96%	442	100%	83%	-1	1,00	-1,00	
	Saint-Jean Return Large	814	80%	1013	79%	100%	-1	0,79	-0,79	
	Dartmouth Return Large	889	118%	756	86%	75%	1	0,75	0,75	
	Madeleine Return Large	922	137%	672	94%	74%	1	0,74	0,74	
	Sainte-Anne Return Large	780	134%	584	82%	60%	1	0,60	0,60	
	Mitis Return Large	873	237%	369	89%	50%	1	0,50	0,50	
	De la Trinité Return Large	113	29%	385	88%	100%	-1	0,88	-0,88	
	De la Trinité Return Small	150	26%	578	90%	85%	-1	0,90	-0,90	
	De la Trinité 2SW Survival	0,28	57%	0,49	100%	68%	-1	1,00	-1,00	
	possible range				*-0,88*	*0,80*				
	Average		98%						**-0,27**	**No**
Newfoundland										
	possible range									
	Average								**NA**	**Unknown**
Labrador										
	possible range									
	Average								**NA**	**Unknown**
Southern NEAC										
	possible range									
	Average								**NA**	**Unknown**

* 2020 value: or if not available, the latest value of the time-series.

Figure 5.9.1.1. Framework of Indicators spreadsheet for the West Greenland fishery. For illustrative purposes, the 2020 value of returns or survival rates for the 19 retained indicators is entered in the cells corresponding to the annual indicator variable values.

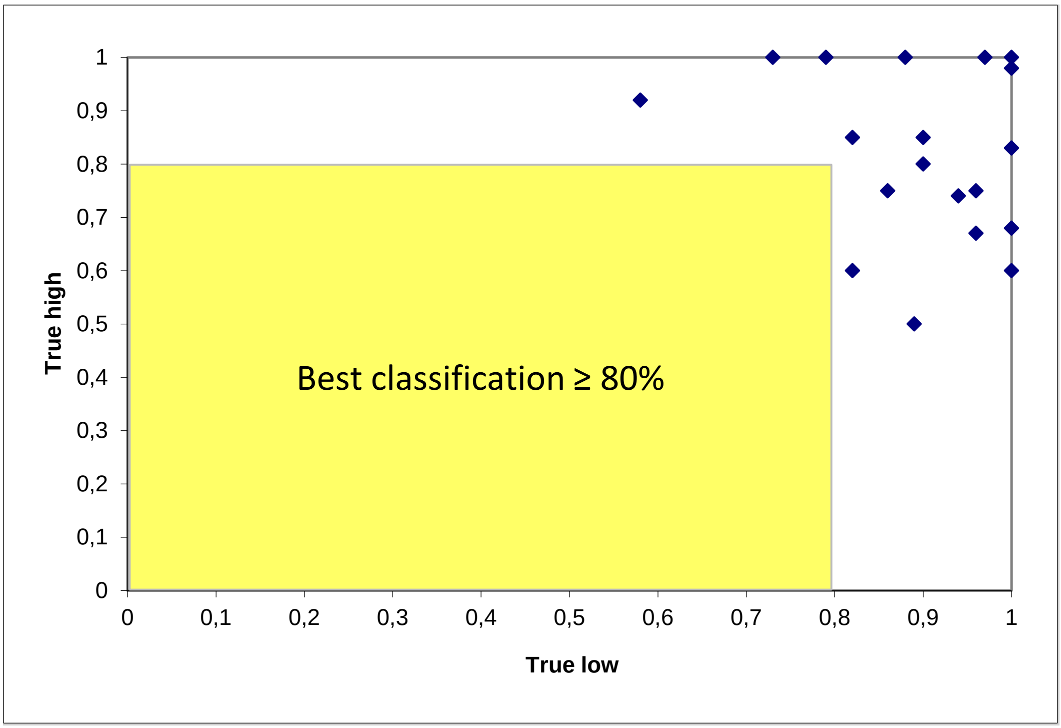


Figure 5.9.1.2. Comparative performance of the retained indicators (N = 19 at identifying a true low (i.e. management objective will not be met) and a true high (i.e. management objective will be met) for the West Greenland multiyear catch advice framework.

Annex 1: List of Working Papers submitted to WGNAS 2021

The table below lists the working documents presented to the WGNAS 2021 and are inserted in full in this annex in the following pages.

WP No.	Authors	Title
01	Nygaard, R.	The salmon fishery in Greenland 2020
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 2020
03	Bardarson, H., Gudbergsson, G., Jonsson, I.R., and Sturlaugsson, J.	National Report for Iceland: The 2020 Salmon Season
04	Prusov, S.	Atlantic Salmon Fisheries and Status of Stocks in Russia. National Report for 2020
05	Erkinaro, J., Orell, P., Falkegård, M., Kylmäaho, M., Johansen, N., Haantie, J., Pohjola, J.-P. and 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 2020
07	Ahlbeck Bergendahl, I. and Jones, D.	Fisheries, Status and Management of Atlantic Salmon stocks in Sweden: National Report for 2020
08	Jepsen, N.	National report for Denmark -2020
09	Jacobsen, J.A.	Status of the fisheries for Atlantic salmon and production of farmed salmon in 2020 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 2020 Salmon Season
11	Marine Scotland Science, Salmon and Freshwater Fisheries	National Report for UK (Scotland): 2020 season
12	Cefas, Environment Agency and Natural Resources Wales	Salmon stocks and fisheries in UK (England and Wales), 2020
13	Ensing, D., and Kennedy, R.	Summary of Salmon Fisheries and Status of Stocks in Northern Ireland for 2020
14	Buoro, M.	National report France including Saint Pierre and Miquelon 2020
15	Camara, K.	GenMolAr (Genetic Monitoring of reintroduced Atlantic salmon in the Rhine system) project

WP No.	Authors	Title
16	de la Hoz, J.	Salmon Fisheries and Status of Stocks in Spain (Asturias-2020)
17	April, J. and Cauchon, V.	Status of Atlantic salmon Stocks in Québec in 2020
18	April, J. and Cauchon, V.	Smolt production, freshwater and sea survival on two index rivers in Québec, the Saint-Jean and the Trinité (2020)
19	Kelly, N.I., Robertson, M.J., Burke, C., Duffy, S., Poole, R., Bradbury, I., Van Leeuwen, T., Dempson, J.B., Lehnert, S., Lancaster, D. and Loughlin, K.	Status of Atlantic Salmon (*Salmo salar*) Stocks within the Newfoundland and Labrador Region (Salmon Fishing Areas 1–14B), Canada in 2020
20	Dauphin, G., Breau, C., Chaput, G., Cairns, D., Caissie D. Daigle A., Douglas S.	Atlantic Salmon (*Salmo Salar*) in DFO Gulf Region Salmon Fishing Areas 15–18 to 2020
21	Raab, D., and Taylor, A.D.	Status of Atlantic salmon in Canada's Maritimes Region (Salmon Fishing Areas 19 to 21, and 23).
22	Hawkes, J., Kocik, J., Atkinson, E., Sweka, J. and Sheehan, T.F.	National Report for the United States, 2020
23	Robertson, M. *et al*.	Catch Statistics and Aquaculture Production Values for Canada: preliminary 2020, final 2019
24	Freese, M.	Diadromous fish and EU Data Collection framework. 2020 update
25	Chaput, G., Robertson, M., Bradbury, I.	Assessment of the performance of fishery sampling programs to estimate catches of non-local origin salmon in mixed stock fisheries of Labrador
26	Rivot, E., Patin, R., Olmos, M., Chaput, G., Hernvann, P-Y.	A hierarchical Bayesian life cycle model for Atlantic salmon stock assessment at the North Atlantic basin scale.
27	Hernvann, P.-Y., Patin R., Guitton J., Olmos M., Etienne M.-P., Labouyrie M., Bezier L., Rivot E.	WGNAS-SalmoGlob ToolBox: a web application for supporting Atlantic salmon stock assessment at the North Atlantic basin scale
28	Dahlgren, E., and Persson, L.	Salmon health project
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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 2020 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
	2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10 138	32
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

		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	233 690	425	-	-	-	-	-	-	-	-	106 379	486	-	-	340 069	911
	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

		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	37 075	63	-	-	-	-	-	-	-	-	10 311	49	-	-	47 386	112
	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
Canada	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	30 759	53	-	-	-	-	-	-	-	-	9 774	47	-	-	40 533	100
	2020	31 512	55	-	-	-	-	-	-	-	-	10 176	49	-	-	41 688	104
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

		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
	1985	23	-	528	2	2	-	-	-	-	-	-	-	13	-	566	2
	1986	76	-	482	2	2	-	-	-	-	-	-	-	3	-	563	2
	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

		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
	2002	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2003	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	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

		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
	2019	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
	2020	0	0	0	0	0	0	-	-	-	-	-	-	-	-	0	0
Faroe	1982/83	9 086	-	101 227	-	21 663	-	448	-	29	-	-	-	-	-	132 453	625
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

		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
	1997/98	339	-	1 315	-	109	-	-	-	-	-	-	-	-	-	1 763	6
	1998/99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
	1999/00	225	-	1 560	-	205	-	-	-	-	-	-	-	-	-	1 990	8
	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

		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
	2014/15	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2015/16	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2016/17	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2017/18	1	-	1	-	1	-	-	-	-	-	-	-	-	-	0	0
	2018/19	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2019/20	0	-	0	-	0	-	-	-	-	-	-	-	-	-	0	0
	2020/21	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

		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
	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
	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

		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
	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
	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
	2020	2 064	3	477	2	746	7	30	0	-	-	-	-	488	3	3 805	16
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

		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	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
	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	39	2 848	12	-	-	-	-	-	-	-	-	-	-	19 859	50

		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	40 412	97	4 274	19	-	-	-	-	-	-	-	-	-	-	44 686	116
	2014	13 593	29	3 317	22	-	-	-	-	-	-	-	-	-	-	16 910	51
	2015	33 713	78	3 201	16	-	-	-	-	-	-	-	-	-	-	36 914	94
	2016	19 528	49	5 082	23	-	-	-	-	-	-	-	-	-	-	24 610	71
	2017	20 229	51	3 726	15	-	-	-	-	-	-	-	-	-	-	23 955	66
	2018	18 753	48	2 661	12	-	-	-	-	-	-	-	-	-	-	21 414	61
	2019	11 102	267	2 932	10	-	-	-	-	-	-	-	-	-	-	14 034	37
	2020	12 875	33	2 368	9	-	-	-	-	-	-	-	-	-	-	15 243	41.8
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

		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
	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
	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

		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
	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
	2020	976	2	-	-	-	-	-	-	-	-	2082	12	-	-	3058	14
Norway	1981	221 566	467	-	-	-	-	-	-	-	-	213 943	1 189	-	-	435 509	1 656
	1982	163 120	363	-	-	-	-	-	-	-	-	174 229	985	-	-	337 349	1 348
	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

		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
	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
	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

		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
	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
	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
	2020	79 612	143	52 344	239	15 868	145	-	-	-	-	-	-	-	-	147 824	527
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

		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
	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
	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

		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
	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
	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
	2020	8 870	20	4 399	23	605	5	13	0	0	0	-	-	71	0	13 957	49
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

		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
	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
	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

		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
	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
	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17 866	58
	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16 521	44

		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
	2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23 147	62
UK	1985	62 815	-	-	-	-	-	-	-	-	-	32 716	-	-	-	95 531	361
(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
	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

		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	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
	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

		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	5 052	-	-	-	-	-	-	-	-	-	6 174	-	-	-	11 226	42
	2019	497	-	-	-	-	-	-	-	-	-	642	-	-	-	1139	5
	2020	335	-	-	-	-	-	-	-	-	-	433	-	-	-	768	3
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
	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

		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	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
UK	2007	32 335	71	-	-	-	-	-	-	-	-	24 098	100	-	-	56 433	171
(Scotland)	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

		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	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	2 480	5	-	-	-	-	-	-	-	-	1 890	8	-	-	4 370	13
	2020	2 480	5	-	-	-	-	-	-	-	-	1 890	8	-	-	4 370	13
France (5)	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
	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

		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	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
	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

		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	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	1 106	-	-	-	-	-	-	-	-	-	2 660	-	-	-	3766	-
	2020	890	-	-	-	-	-	-	-	-	-	1 304	-	-	-	2 194	-
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
	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

		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
	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
	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

		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
	2019	125	0	-	-	-	-	-	-	-	-	866	4	-	-	991	5
	2020	244	0.6	-	-	-	-	-	-	-	-	816	4	-	-	1 060	5
Denmark	2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 946	9
UK (Northern Ireland)	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	899	2
	2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	478	1

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; mis-classification 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 2019–2020 with 2SW, MSW and Not-Specified assigned to MSW.

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

4. Scotland 2020 data not available at time of printing, 2019 data repeated as Provisional.

5. France data for 2019 and 2020 show catch number only, as reported by the recreational fishery that doesn't report catch weight.

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.27.neac	Salmon (*Salmo salar*) in Northeast Atlantic	April 2021	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).

BCI (Bayesian credible intervals).

B_{pa} (Biomass for precautionary approach).

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.

CoASal (Conserving our Atlantic salmon as a sustainable resource for people of the North; fisheries and conservation in the context of growing threats and a changing environment). A project under the EU's Kolarctic project.

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).

CV (coefficient of variation).

COVID-19 (Coronavirus pandemic).

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). European Union multiannual programme which includes the Data Collection Framework.

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.

eDNA (Environmental DNA).

EU (European Union).

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.

ISSG Diad (Intersessional Sub Group Diadromous Fish of the Regional Coordination Groups (RCG's)).

IYS (International Year of the Salmon).

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

LCM (North Atlantic wide Life Cycle Model or Bayesean Life Cycle Model).

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.

MSY (Maximum Sustainable Yield).

MSY.$B_{escapement}$ (amount of biomass left to spawn).

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.

NIMBLE (Software package in R Programming language).

NINA (Norwegian Institute of Nature Research).

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.

NPAFC (North Pacific Anadromous Fish Commission).

PICES (North Pacific Marine Science Organization).

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.

R (a computer programming language).

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**).**

RSD (red skin disease**).**

SALSEA-merge (Salmon at Sea – merge). European Commission 7th Framework Programme and partner organisation funded scientific project to investigate the migration and distribution of Atlantic salmon in the Northeast Atlantic.

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

SE (standard error).

SER (*Spawner 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.

S_{lim} (limit reference point).

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

S_{pa} (ICES Precautionary target reference point).

St P & M (*St Pierre and Miquelon*). Islands of France south of Newfoundland.

TAC (Total Allowable Catch).

ToR (Terms of reference).

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

VIE (Visual Implant Elastomer Tag).

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

WGDIAD (Working Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species) A Working Group of ICES.

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.

WKBaltSalMP I and II (ICES Workshop on Evaluating Draft Baltic Salmon Management Plan).

UNDOS (United Nations Decade of Ocean Science for Sustainable Development).

USA (United States of America).

Annex 7: Data deficiencies, monitoring needs and research requirements

The Working Group recommends that it should meet in 2022 (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 28 March–7 April 2022.

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 have 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 continues to recommend 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 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.

Annex 8: ICES WGNAS Data call review

8.1 Data submitted to ICES

Prior to data submission, the Data Coordinator, WG chair and members from several countries provided clarifications on:

- filename;
- where to submit the data;
- whether to submit data at national or river-specific levels;
- the deadline for submission; how to communicate with ICES; and
- how to treat data from previous years that needed to be revised.

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

The instructions with the Data Call indicated that the filename format for the 2020 data (2021 Data Call) was to be:

2021 DC [expertgroup] [ICES stock code/stock codes] [country] [type of data]

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.

The data file format was not specified but the excel template was provided as an Excel worksheet with drop-down menus. Most of the data files submitted followed the template format. All files were readable and the data could be resolved with simple conversions in Excel.

The Data Call 2021 was much more successful, than Data Call 2020, in providing the data necessary to complete the Section 2 text, tables and figures, with 11 countries/jurisdictions providing all, or almost all, of the data in their Data Call responses (cf 1 in 2020). This bodes well for the automation of this section's production based on Data Calls in future years.

The following text provides a reminder of the general principles of the Data Call process and highlights where some improvements are sought for submissions in future years.

Data Call template schema

The Data Call provided a template schema (Excel spreadsheet DC_Annex_7.12.1 WGNAS Template) with a glossary and vocabulary codes plus pre-defined columns and descriptions of data fields and codes (drop-down menus) for several of the data fields.

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 provided.

The catch data are also used in the run reconstruction, stock status, and the development of catch advice by the Working Group. Future 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 2020).

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 for the most recent reporting year are provisional, the expectation would be that the database from previous year(s) would be updated with final values when these become available.

Corrections for earlier years were requested to be reported to the EG chair and Advice@ices.dk, in Section 5 of the covering letter. However, this request was not clear to everyone so will be more explicit and clear within the data template in future years. The standing requirement will be to provide data for the reporting year, labelled provisional or final, and also any data for previous years that has been corrected (e.g. revised from provisional to final).

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 was provided. 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).

Subtotals or data aggregations were reported in two responses, heightening the risk of double counting. Such reporting must be avoided in future years.

Fishery descriptors (F_TYPE)

The descriptors and categories of fishery type were revised for the 2021 template to provide:

COM = commercial; REC = recreational; FARM = farmed; RAN = ranched; INDG = indigenous; SUBS = subsistence (food) fishery; and, NS = not specified.

SUBS was further defined by WGNAS 2020 to be used to report on licensed 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.

Catch Data

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). In some cases, in 2021, catch numbers were reported to decimal places. This should be avoided.

Zero catch would be entered as null (0).

Empty cells would be used for missing values. Reasons for missing values are provided in the 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) should be provided using codes in the variable called "DATA_QUALITY", as defined below.

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).

Reporting was not as complete as this specification, i.e. some countries only reported rows where fisheries existed. This is not an issue while the data are extracted manually, but will need checking when the process becomes automated.

8.2 Proposed changes to database schema and data entry

Several changes are proposed to the data entry template.

- Explicit instructions on reporting updated or revised values for previous years.
- Addition of a PS code for repeat spawners

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, one week ahead of the start of the WGNAS meeting, should be sufficient to allow checking of the entries in the days before or at the start of the meeting, prior to running the collation, analyses and reporting. An earlier request date could not be accommodated by all jurisdictions. For most jurisdictions, the data provided are provisional.

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, ICES will provide the most current data sheet to a requesting party to which revisions could be made and returned to ICES.