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Newfoundland and Labrador Region

Status of Atlantic Salmon (*Salmo salar* L.) stocks within the Newfoundland and Labrador Region (Salmon Fishing Areas 1-14B), 2016

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Foreword

This series documents the scientific basis for the evaluation of aquatic resources and ecosystems in Canada. As such, it addresses the issues of the day in the time frames required and the documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

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ABSTRACT

In 2016, Atlantic Salmon populations were monitored on 17 rivers in Newfoundland and Labrador (NL; Salmon Fishing Areas [SFAs] 1–14B). Seven of 14 (50%) monitored rivers recorded declines in total returns of greater than 30% compared to their recent five-year mean. Declines of this magnitude over a wide geographic range are highly unusual for the NL Region warranting caution in managing stocks in 2017. Conservation egg requirements were achieved on one (25%) of the four assessed rivers in Labrador and seven (54%) of the 13 assessed rivers in Newfoundland. Labrador Aboriginal and subsistence fisheries harvest was inferred from log book returns (70% return rate) at 13,236 salmon (39.6 t) in 2016, which was 7% less, by number, than the previous six-year mean of 14,264 salmon (38.3 t). Estimates of retained salmon in the recreational fishery in 2016 (30,056 or 53 t) and total catch (66,407 salmon) were 14% and 21% greater by number, respectively than the previous five-year mean. In general, annual returns of salmon are highly variable and populations on the south coast continue to decline. Marine smolt survival is considered to be a major factor limiting the abundance of Atlantic Salmon within the region.

État du stock de saumon de l'Atlantique (Salmo salar L.) de la Région de Terre-Neuve-et-Labrador (zones de pêche du saumon 1-14B), 2016

RÉSUMÉ

En 2016, les populations de saumon de l'Atlantique ont fait l'objet d'une surveillance dans 17 rivières à Terre-Neuve-et-Labrador (T.-N.-L.; zones de pêche du saumon [ZPS] 1–14B). Sept (50 %) des quatorze rivières surveillées ont enregistré des déclins des montaisons totales de saumons de plus de 30 %, comparativement à la moyenne des cinq dernières années. Des déclins de cette ampleur dans un territoire aussi vaste que la région de Terre-Neuve-et-Labrador sont très rares. Il faut donc faire preuve de prudence dans la gestion des stocks en 2017. Les exigences de conservation (ponte) ont été atteintes dans une (25 %) des quatre rivières évaluées au Labrador et dans sept (54 %) des treize rivières évaluées à Terre-Neuve. Les journaux de bord retournés (taux de retour : 70 %), indiquent que la récolte des pêches autochtones et de subsistance au Labrador a été de 13 236 saumons (39,6 t) en 2016, ce qui représente 7 % de moins, en nombre, que la moyenne des six années précédentes, de 14 264 saumons (38,3 t). Selon les estimations, les prises conservées dans le cadre de la pêche récréative en 2016 s'élèvent à 30 056 saumons (53 t) et les prises totales se chiffrent à 66 407 saumons, ce qui représente des hausses respectives de 14 % et 21 % par rapport à la moyenne des cinq années précédentes. De manière générale, les retours de saumons varient considérablement d'une année à l'autre et les populations de la côte sud continuent de diminuer. La survie en mer des saumoneaux est considérée comme un des principaux facteurs qui limitent l'abondance du saumon de l'Atlantique dans la région.

INTRODUCTION

In 2014, the Department of Fisheries and Oceans (DFO) began implementing a five-year management plan for Atlantic Salmon in the NL Region. Although management measures outlined in the plan were expected to remain the same over this five-year period, changes could be warranted if there was a dramatic change in salmon stocks, particularly declines (DFO 2017). An annual update of the stock status in 2015 (DFO 2016) indicated that no change to the five-year management plan was warranted. However, in 2016, preliminary estimates of total returns on seven assessed stocks recorded declines of greater than 30% compared to their previous five-year mean. These declines triggered a re-opening of the five-year management plan including a full assessment of the status of the 2016 Atlantic Salmon stocks in the NL Region. This report provides supporting documentation for the 2016 assessment (DFO 2017) as well as the finalized 2016 assessment data.

There are 15 Atlantic Salmon management areas, known as Salmon Fishing Areas (SFAs) 1-14B, in NL (Figure 1). Within these areas there are 394 rivers known to contain wild Atlantic Salmon populations (Reddin et al. 2010) that are characterized by differences in life history traits, including freshwater residence time, age at first spawning, and the extent of ocean migration. Spawning populations consist of varying proportions of small (fork length [FL] < 63 cm) and large (FL ≥ 63 cm) salmon. The majority of rivers in Newfoundland (SFAs 3-12) contain populations of small salmon, which are predominantly maiden fish (never spawned before) that have spent one-year at sea before returning to spawn (grilse, one-sea-winter, [1SW]). The large salmon component in this area consists mainly of repeat spawners (repeat-spawning grilse) which are returning for a second or subsequent spawning. In Labrador (SFAs 1, 2 and 14B) and Western Newfoundland (SFAs 13 and 14A), there are important large salmon components that contain maiden fish which have spent two (two-sea-winter [2SW]) or more years (multi-sea-winter [MSW]) at sea before spawning.

There has been no commercial salmon fishing in insular Newfoundland (SFAs 3-14A) since 1992, the Straits area of Labrador (SFA 14B) since 1997, and the rest of Labrador (SFAs 1-2) since 1998. Atlantic Salmon fisheries in the NL Region are currently recreational, subsistence (Food, Social and Ceremonial [FSC]), and resident. Details regarding historical fishery management changes to salmon fisheries in the NL Region can be found in Bourgeois et al. (2012).

METHODS

The 2016 status of Atlantic Salmon stocks within NL (SFAs 1–14B) was assessed using data collected from various salmon monitoring facilities (counting fences and fishways) (Figure 1) and the recreational fishery. The Licence Stub Return System (O'Connell et al. 1996a, 1998) provided recreational catch and effort data for SFAs 2-14B, except for Eagle River and Sand Hill River in SFA 2 where private fishing camps' data were used. DFO Conservation and Protection (C&P) staff and fishing camp operator logs provided recreational fishery data for SFA 1.

The total returns of small (< 63 cm FL) and large (≥ 63 cm FL) Atlantic Salmon to monitored rivers were reported and include estimates of fishery removals downstream of the monitoring facility. The 2016 estimates of total returns (large and small combined) were compared to their recent five-year and ten-year mean. Smolts were assessed at four rivers using a counting fence (Campbellton River, Rocky River, Garnish River, and Western Arm Brook).

Conservation egg requirements for Atlantic Salmon have been established for individual rivers in Labrador (SFAs 1-2) based on 1.9 eggs per m^2 of river rearing habitat, and in Newfoundland

(SFAs 3-13) based on 2.4 eggs per m^2 of river rearing habitat and 368 eggs per hectare of lake habitat, and the Straits Area of Labrador (SFAs 14A-14B) based on 2.4 eggs per m^2 of river rearing habitat and 105 eggs per hectare of lake habitat (O'Connell and Dempson 1995; O'Connell et al. 1996b; O'Connell et al. 1997; Reddin et al. 2006).

Conservation egg requirements are considered to be limit reference points. The level to which egg depositions can fall below conservation before threatening the long term sustainability of the population needs to be determined. According to the Wild Atlantic Salmon Conservation Policy (DFO 2009), at some level below conservation, "*the population is at a level of abundance at which further mortalities will lead to continued decline in the spawner abundance and an increasing risk of serious harm.*" Atlantic Salmon stock status is currently assessed based on the proportion of the conservation egg requirement achieved in a given year and trends in abundance of various life stages. Comparisons are generally made to a long-term mean (moratorium years of the commercial salmon fishery) as well as the previous five-year mean for Newfoundland and six-year mean for Labrador, which correspond to the average Atlantic Salmon generation time in those areas.

RESULTS AND DISCUSSION

RECREATIONAL FISHERY DATA

Recreational fishery data are presented for the period 1994–2016 (Figures 2 and 3; Tables 1 and 2). Fishing effort is presented as rod days, defined as any day or part of a day in which an angler fished. Retained catch as well as the number of salmon caught and released are presented separately for NL. Catch per unit effort (CPUE) was calculated using total catch (retained plus released fish).

Labrador (SFAs 1, 2 and14B)

The number of small salmon retained in the recreational fishery in Labrador in 2016 was estimated at 1,669 (2.9 t). This is an approximately 14% increase compared to the previous six-year mean of 1,469. However, there has been a significant (r^2=0.82) declining trend in the number of small salmon being retained in Labrador over the time series. The number of caught and released small salmon in the recreational fishery in Labrador in 2016 was estimated at 7001, which is above the previous six-year average of 5,980 (17% increase). However, there is no evidence of an increasing trend in caught and released salmon in Labrador. Retention of large salmon ceased in the Labrador recreational fishery in 2011 and therefore no retention of large salmon was reported for Labrador in 2016. Estimates of the number of released large salmon in Labrador have fluctuated widely over the past five years with the estimate for 2016 (3,201) being nearly double that of the previous six-year mean of 1,637 fish. Effort in the Labrador recreational salmon fishery reached a series low in 2012, but has since rebounded with 2016 producing an average year of effort (6,986 rod days). Catch per unit effort has been increasing in Labrador over the time series with anglers averaging over one fish per rod day in the past six years.

Newfoundland (SFAs 3-14A)

The retention of small salmon in the recreational fishery in Newfoundland in 2016 was estimated at 28,387 (50 t). This was 14% greater than the previous five-year mean of 24,872 fish. The number of released salmon in the recreational fishery in 2016 was 29,350 which was 29% greater than the previous five-year mean and reverses the trend of declining numbers of released fish that started in 2010. Retention of large salmon has not been permitted in

Newfoundland for the entire time series. Estimates of the number of released large salmon have fluctuated widely over the time series from a low of 3,014 in 2002 to a series high of 7,005 in 2016. This is 54% greater than the previous five-year mean of 4,541 released large salmon. Effort in Newfoundland in 2016 was 139,452 rod days which was 17% greater than the previous five-year average. Catch per unit effort in Newfoundland in 2016 was 0.41, which is similar to the previous five-year mean of 0.40.

Recreational Salmon Fishery Licences

Total recreational licence sales in NL in 2016 were estimated to be 24,791 (Figure 4), which was the second greatest in the time series. Licence sales have been increasing since a low in 2007 which coincided with poor adult salmon returns to rivers in the region.

ABORIGINAL/SUBSISTENCE FISHERY DATA

Aboriginal FSC fisheries for Atlantic Salmon occur in Labrador under communal licences. Labrador also has a resident subsistence fishery for trout and char with a permitted retention of salmon by-catch (three salmon since 2011). In Newfoundland, Miawpukek First Nation (MFN) holds a FSC communal salmon fishing licence, but has chosen not to harvest salmon under this licence since 1997 due to conservation concerns.

Labrador FSC and subsistence fisheries harvested approximately 13,236 salmon (39.5 t) in 2016, which was similar to the previous generation mean (2010–15) of 14,264 salmon (38.3 t) (Table 3 and Figure 5). Large salmon represented 42% of the catch by number (5,598) and 63% (25 t) by weight.

MONITORING FACILITIES - TOTAL RETURNS AND CONSERVATION REQUIREMENTS

A full assessment of the status of the wild Atlantic Salmon stocks in the NL Region was triggered in 2016 when it was estimated that seven of 14 monitored rives (50%) would realize declines in total returns of adult salmon of greater that 30% when compared to their recent five-year mean. The trigger document and the estimates of total returns, upon which the decision to re-assess the status of the stocks, is given in Appendix I. Although 17 rivers were monitored in 2016 only 14 were included in the decision making process. Garnish River and North East River (Placentia Bay) did not have recent five-year means in total returns against which the 2016 returns could be compared, and the fishway at Rocky River was under repair in 2015 and 2016 raising concerns around the accuracy of the estimates of total returns in those years. This left 14 rivers upon which to compare total returns and to base a recommendation to Fisheries Management. It should be noted that the total returns given in Appendix I are estimates produced prior to the collection and analyses of all available angling data. Therefore, the values given in Appendix I are considered preliminary and do not exactly match the values for total returns given in Tables 4 and 5 which are considered final.

Labrador (SFAs 1, 2 and 14B)

Northern Labrador (SFA 1)

Total Returns (Tables 4 and 5, Figure 6)

Information on total returns of small and large salmon in 2016 was available for one Northern Labrador river: English River (SFA 1). Since 2011, returns of small and large salmon have been above both the previous six-year means and moratorium means. However, total returns of small salmon have seen two consecutive years of declines since they reached a series high in 2014.

Conservation Requirement (Table 6a, Figure 12)

English River achieved 255% of its conservation requirement in 2016 and has now achieved conservation in six consecutive years.

Southern Labrador (SFA 2 and 14B)

Total Returns (Tables 4 and 5, Figure 6)

Information on total returns of small and large salmon in 2016 was available for three SFA 2 rivers in Southern Labrador (Southwest Brook, Muddy Bay Brook and Sand Hill River). The 2016 returns of small salmon were below the previous six-year and moratorium means for all SFA 2 monitored rivers. Returns of large salmon in 2016 were also below the previous six-year and moratorium means for Muddy Bay Brook and Southwest Brook (Paradise River), but were higher for Sand Hill River.

Conservation Requirement (Table 6a, Figure 12)

The three assessed rivers in SFA 2 did not achieve conservation in 2016; Southwest Brook 38%, Muddy Bay Brook 93% and Sand Hill River 60%.

Newfoundland (SFAs 3–14A)

Northeast Coast (SFAs 3–8)

Total Returns (Tables 4 and 5, Figures 7 and 8)

Information on total returns of small and large salmon in 2016 was available for five Northeast Coast rivers: Exploits River (SFA 4), Campbellton River (SFA 4), Salmon Brook (Gander River) (SFA 4), Middle Brook (SFA 5) and Terra Nova River (SFA 5). With the exception of Terra Nova River which saw an increase in total returns of small salmon in 2016, all other Northeast Coast rivers had total returns well below the previous five-year mean. As well in 2016, Exploits River, Campbellton River and Salmon Brook had total returns of small salmon below the moratorium mean for the first time in eight years. The 2016 returns of large salmon were also below the previous five-year means for assessed rivers in SFAs 3–8, except for Salmon Brook which had returns of large salmon 65% greater than the previous five-year mean. The sharp increase in large salmon returns to Salmon Brook may be an artifact of a new operator who began in 2015, and is being studied.

Conservation Requirement (Table 6b, Figure 13)

Three of the five assessed Northeast Coast rivers achieved conservation in 2016, Campbellton River (245%), Salmon Brook (117%), and Middle Brook (363%). The Exploits River (37%) and Terra Nova River (86%) did not achieve conservation in 2016. The Exploits River was also assessed in three sections:

1. Lower - Below Grand Falls 41%;
2. Middle – between Grand Falls and Red Indian Lake 44%; and
3. Upper – above Red Indian Lake 3%.

It should be noted that decades ago, with the building of fishways on Exploits River and Terra Nova River, large areas of habitat were made available to salmon, which is included in the conservation requirement calculation. The lack of conservation achieved on these rivers suggests that even after long periods of time salmon have not fully colonized these watersheds.

South Coast (SFAs 9–11)

Total Returns (Tables 4 and 5, Figures 9 and 10)

Information on total returns of small and large salmon in 2016 was available for five South Coast rivers: Rocky River (SFA 9), Northeast River (Placentia Bay) (SFA 10), Garnish River (SFA 11), Little River (SFA 11) and Conne River (SFA 11). Northeast River is a facility that operated from 1984-2002 and was re-opened in 2015, and Garnish River is a new counting facility that began operating in 2015. Therefore, recent five-year trends are not available for these two rivers, and a moratorium mean is not available for Garnish River.

Total returns of salmon to Rocky River in 2016 would be considered a minimum estimate because the fishway on Rocky River was replaced in 2015 and was still not fully operational in 2016. Total returns of small salmon to Rocky River in 2016 were below the moratorium and recent five-year mean, while total returns of large salmon were below the moratorium mean but similar to the recent five-year mean. Total returns of small salmon to Northeast River (844) were similar to the moratorium mean of 779 fish, while the total returns of large salmon were 19% less than the moratorium mean. However, absolute numbers of large salmon returning to Northeast River are quite small (e.g. 101 in 2016). There was a large decline in the total returns of small and large salmon to Garnish River in 2016 compared to 2015 (56% and 54%, respectively. However, with no long-term data on this river it is not possible to know how much of this difference could be attributable to natural annual variability.

Total returns of small salmon to Conne River in 2016 were 40% below the previous five-year mean and were the lowest on record. Returns of large salmon were 21% lower than the previous five-year average and the third lowest during the past 10 years. Over a 31-year period (1986–2016) returns of small salmon at Conne River have declined by 74%, while numbers of large salmon have decreased by 79%. During the past 15-years (2002–16), small and large salmon have each declined by about 40% with no indication of any improvement. As noted in past status reviews, a retrospective analysis was previously carried out to infer a plausible range of returns to Conne River during the 10-year period prior to 1986 (1976–85) (Robertson et al. 2013). Results from this analysis indicated that the number of salmon returning to Conne River was generally similar to the range of returns observed at the fish counting facility during the first five years of operation (1986–90), further highlighting the dramatic declines since the early 1990s.

At Little River, returns of small salmon in 2016 were 62% below the previous five-year mean and were the third lowest since counts began in 1987. Only one large salmon came back to the river. Since 1996, returns of small salmon at Little River have been correlated with counts of salmon returning to Conne River (r^2=0.664; P < 0.001). Over the past 21 years (1996–2016), returns of small and large salmon have declined by 87% and 99%, respectively.

Conservation Requirement (Table 6b, Figure 13)

The percent conservation requirement achieved for Rocky River in 2016 would also be considered a minimum estimate given the issues with the fishway. Nevertheless, the calculated percent conservation achieved was 29. Northeast River (Placenta Bay) achieved 438% of its conservation requirement, whereas Garnish River only achieved 20%. Little River only achieved 22% conservation, which is the second lowest on record; the lowest was 2014 (21%). Little River has met conservation twice since 2004 (2010 and 2013). Percent conservation requirement achieved for Conne River declined from 110% in 2015 to 56% in 2016, which was the third lowest ever recorded. A population viability analysis (Robertson et al. 2013) noted that under current conditions there was a low probability (< 30%) that Atlantic Salmon populations in south Newfoundland would meet or exceed conservation spawning requirements over the next

15-years. To date, management measures remain the same with no additional measures taken to rebuild populations.

Southwest Coast (SFAs 12–13)

Total Returns (Tables 4 and 5, Figure 11)

Information on total returns of small and large salmon in 2016 was available for one Southwest Coast river: Harry's River (SFA 13). Returns to Harry's River were estimated using a variety of methods from 1992–2010 (Bourgeois et al. 2012). Since 2011, returns were derived from a sonar operation conducted near the mouth of the river. Returns of both small and large salmon to Harry's River in 2016 were greater than the previous five-year and moratorium means.

Conservation Requirement (Table 6b, Figure 13)

Harry's River achieved 125% of its conservation requirement in 2016.

Northwest Coast (SFA 14A)

Total Returns (Tables 4 and 5, Figure 11)

Information on total returns of small and large salmon in 2016 was available for two Northwest Coast rivers (SFA 14A): Torrent River and Western Arm Brook. The return of small salmon on Western Arm Brook in 2016 was 15% greater than moratorium mean and similar to the previous generation (five-year) mean. Total returns of small salmon to Torrent River in 2016 was similar to the moratorium mean and the previous five-year mean. Returns of large salmon to Western Arm Brook are generally quite low (e.g. five-year average = 60), however in 2016 the number of large salmon was 148% greater than the moratorium mean and 90% greater than the previous generation mean. Returns of large salmon to Torrent River in 2016 were 23% greater than the moratorium mean but similar to the previous generation mean of 1,007 fish.

Conservation Requirement (Table 6b, Figure 13)

The conservation requirement was achieved on both Torrent River (677%) and Western Arm Brook (502%) in 2016.

SMOLT PRODUCTION AND MARINE SURVIVAL

In 2016, smolts were enumerated at four rivers in Newfoundland: Campbellton River (SFA 4), Rocky River (SFA 9), Garnish River (SFA 11) and Western Arm Brook (SFA 14A). Traditionally a smolt estimate is carried out at Conne River but owing to a washout of the fence no smolt estimate was available in 2016. A smolt count was initiated at Garnish River in 2016 but the number of smolt counted should be treated as a minimum as the fence washed out at the peak of the smolt run. The smolt count at Campbellton River in 2016 was 12% greater than the previous five-year mean, whereas the smolt counts were 41% and 19% less than the previous five-year mean on Rocky River and Western Arm Brook respectively (Table 7, Figure 14).

Marine survival at Conne River (3.6%) and Rocky River (3.8%) in 2016 were similar to their previous five-year mean. However, marine survival at Campbellton River was 16% less than the previous five-year mean and at Western Arm Brook it was 40% greater in 2016 compared to the previous five-year mean. Marine survival was not available for Garnish as the first smolt count only occurred in 2016. Marine survival rates at the other two South Coast monitored rivers (Rocky River and Conne River) continue to be well below those from the Northeast and Northwest Coast rivers (Table 8, Figure 15).

SUMMARY AND CONCLUSIONS

Seven of 14 (50%) monitored rivers recorded declines in total returns of greater than 30% compared to their recent five-year mean. Declines of this magnitude over a wide geographic range are highly unusual for the NL Region, warranting caution in managing stocks in 2017.

Conservation egg requirements were achieved on one (25%) of the four assessed rivers in Labrador and seven (54%) of the 13 assessed rivers in Newfoundland.

Marine smolt survival is considered to be a major factor limiting the abundance of Atlantic Salmon within the NL Region. Smolt to adult survival of the 2016 smolt class ranged from 3.6% for Conne River to 10.0% for Campbellton River.

Atlantic Salmon harvests in 2016 were estimated at 13,236 salmon in the subsistence/FSC fisheries and 30,056 retained salmon (plus 36,351 released) in the recreational fishery.

SOURCES OF UNCERTAINTY

No current assessments are available on salmon populations in SFAs 3, 6, 7, 12 and 14B as well as the Lake Melville area of SFA 1.

Salmon populations in assessed rivers may be unique and not representative of other rivers within the SFA.

Historical or estimated biological characteristic data (e.g. fecundity, sex ratio, female size) and extrapolated catch data used in the assessment process adds uncertainty in the conservation egg requirement values.

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TABLES

Table 1. Atlantic Salmon recreational fishery catch and effort data for Labrador (SFAs 1, 2, and 14B), 1994–2016.

Year	Effort (Rod Days)	Small Ret.	Small Rel.	Small Total	Large Ret.	Large Rel.	Large Total	Total Ret.	Total Rel.	Total	CPUE
1994	8,449	2,549	3,681	6,230	455	347	802	3,004	4,028	7,032	0.83
1995	7,719	2,493	3,302	5,795	408	508	916	2,901	3,810	6,711	0.87
1996	9,193	2,565	3,776	6,341	334	489	823	2,899	4,265	7,164	0.78
1997	8,394	2,365	2,187	4,552	158	566	724	2,523	2,753	5,276	0.63
1998	8,288	2,131	3,758	5,889	231	814	1,045	2,362	4,572	6,934	0.84
1999	7,592	2,076	4,407	6,483	320	931	1,251	2,396	5,338	7,734	1.02
2000	10,645	2,561	7,095	9,656	262	1,446	1,708	2,823	8,541	11,364	1.07
2001	7,986	2,049	4,640	6,689	338	1,468	1,806	2,387	6,108	8,495	1.06
2002	8,751	2,071	5,052	7,123	207	978	1,185	2,278	6,030	8,308	0.95
2003	8,053	2,112	4,924	7,036	222	1,326	1,548	2,334	6,250	8,584	1.07
2004	8,302	1,808	5,968	7,776	259	1,519	1,778	2,067	7,487	9,554	1.15
2005	8,499	2,007	7,120	9,127	291	1,290	1,581	2,298	8,410	10,708	1.26
2006	6,743	1,656	5,815	7,471	227	1,133	1,360	1,883	6,948	8,831	1.31
2007	7,930	1,762	4,631	6,393	235	1,222	1,457	1,997	5,853	7,850	0.99
2008	9,025	1,936	5,917	7,853	200	1,461	1,661	2,136	7,378	9,514	1.05
2009	7,466	1,355	3,396	4,751	216	1,219	1,435	1,571	4,615	6,186	0.83
2010	6,560	1,477	4,704	6,181	197	1,080	1,277	1,674	5,784	7,458	1.14
2011	5,457	1,628	5,340	6,968	*	2,233	2,233	1,628	7,573	9,201	1.69
2012	4,952	1,376	3,302	4,678	*	1,072	1,072	1,376	4,374	5,750	1.16
2013	5,978	1,389	4,167	5,556	*	2,433	2,433	1,389	6,600	7,989	1.34
2014	7,504	1,529	4,760	6,289	*	1,607	1,607	1,529	6,367	7,896	1.05
2015	6,865	1,417	3,785	5,202	*	1,396	1,396	1,141	5,181	6,598	0.96
2016	6,986	1,669	3,800	5,469	*	3,201	3,201	1,669	7,001	8,670	1.24
2011-15 mean	6,219	1,469	4,343	5,821	33	1,637	1,637	1,502	5,9809	7,482	1.20

Small (<63 cm) and Large (≥63 cm)
Salmon retained (Ret.), released (Rel.) and CPUE = (Total Ret. + Total Rel.)/Effort]
* Retention of large salmon was not allowed

Table 2. Atlantic Salmon recreational fishery catch and effort data for Newfoundland (SFAs 3–14A), 1994–2016.

Year	Effort (Rod Days)	Small Ret.	Small Rel.	Small Total	Large Ret.	Large Rel.	Large Total	Total Ret.	Total Rel.	Total	CPUE
1994	132,935	29,225	20,761	49,986	*	4,685	4,685	29,225	25,446	54,671	0.41
1995	128,309	30,512	22,971	53,483	*	4,658	4,658	30,512	27,629	58,141	0.45
1996	153,759	35,440	30,566	66,006	*	5,720	5,720	35,440	36,286	71,726	0.47
1997	123,165	22,819	23,129	45,948	*	4,154	4,154	22,819	27,283	50,102	0.41
1998	123,041	22,668	27,610	50,278	*	3,561	3,561	22,668	31,171	53,839	0.44
1999	123,840	22,870	20,160	43,030	*	3,222	3,222	22,870	23,382	46,252	0.37
2000	127,639	21,808	22,610	44,418	*	5,033	5,033	21,808	27,643	49,451	0.39
2001	102,768	20,977	17,708	38,685	*	3,716	3,716	20,977	21,424	42,401	0.41
2002	95,143	20,913	18,019	38,932	*	3,014	3,014	20,913	21,033	41,946	0.44
2003	94,862	21,226	16,455	37,681	*	3,639	3,639	21,226	20,094	41,320	0.44
2004	91,151	19,946	17,462	37,408	*	3,649	3,649	19,946	21,111	41,057	0.45
2005	117,114	21,869	26,009	47,878	*	5,308	5,308	21,869	31,317	53,186	0.45
2006	106,900	19,394	24,676	44,070	*	4,561	4,561	19,394	29,237	48,631	0.45
2007	87,655	14,577	13,088	27,665	*	3,385	3,385	14,577	16,473	31,050	0.35
2008	143,674	27,497	26,870	54,367	*	5,573	5,573	27,497	32,443	59,940	0.42
2009	137,465	23,103	23,285	46,388	*	3,053	3,053	23,103	26,338	49,441	0.36
2010	121,705	29,018	34,342	63,360	*	5,303	5,303	29,018	39,645	68,663	0.56
2011	111,494	27,116	20,900	48,016	*	5,886	5,886	27,116	26,786	53,902	0.48
2012	108,701	21,893	17,638	39,531	*	3,017	3,017	21,893	20,655	42,548	0.39
2013	128,370	23,004	15,795	38,799	*	4,337	4,337	23,004	20,132	43,136	0.34
2014	110,718	22,591	14,853	37,444	*	3,781	3,781	22,591	18,634	41,225	0.37
2015	134,515	29,756	21,597	51,353	*	5,683	5,683	29,756	27,280	57,036	0.42
2016	139,452	28,387	22,345	50,732	*	7,005	7,005	28,387	29,350	57,737	0.41
2011-15 mean	118,760	24,872	18,157	43,029	*	4,541	4,541	24,872	22,697	47,569	0.40

Small (<63 cm) and Large (≥63 cm)
Salmon retained (Ret.), released (Rel.) and catch per unit effort [CPUE = (Total Ret. + Total Rel.)/Effort]
* Retention of large salmon was not allowed

Table 3a. Harvests of Atlantic Salmon in the subsistence and FSC Fisheries in Labrador (SFA 1), 2000-16.

Year	Small Number	Small Weight (kg)	Large Number	Large Weight (kg)	Total Number	Total Weight (kg)
2000	4,111	8,111	1,092	4,364	5,203	12,475
2001	3,394	6,995	1,299	5,121	4,708	12,117
2002	3,609	7,386	1,015	4,441	4,624	11,827
2003	4,382	9,094	1,639	7,026	6,021	16,120
2004	4,822	10,038	2,210	8,656	7,032	18,694
2005	4,958	10,116	1,687	6,930	6,644	17,046
2006	5,422	11,189	1,639	6,330	7,061	17,519
2007	4,700	8,306	1,560	5,314	6,261	13,619
2008	5,144	10,325	2,944	13,572	8,088	23,896
2009	3,964	8,173	1,907	8,232	5,871	16,405
2010	6,227	13,116	2,689	11,351	8,916	24,468
2011	6,473	13,837	2,950	12,826	9,424	26,663
2012	5,740	10,629	3,162	14,122	8,901	24,751
2013	3,754	7,754	4,362	17,935	8,116	25,689
2014	5,291	10,659	2,965	11,155	8,256	21,814
2015	4.821	9,513	4,159	17,842	8,979	27,354
2016	4,114	7,891	4,243	20,091	8,357	27,983

Table 3b. Harvests of Atlantic Salmon in the subsistence and FSC Fisheries in Labrador (SFA 2), 2000-16.

Year	Small Number	Small Weight (kg)	Large Number	Large Weight (kg)	Total Number	Total Weight (kg)
2000	1,212	2,242	260	897	1,472	3,139
2001	1,396	2,793	374	1,378	1,770	4,172
2002	2,197	4,196	422	1,549	2,619	5,745
2003	2,095	4,102	536	1,885	2,632	5,987
2004	3,564	7,341	1,486	5,512	5,050	12,852
2005	5,479	10,922	1,130	3,946	6,609	14,868
2006	4,955	10,008	1,451	5,193	6,406	15,201
2007	4,507	8,764	1,092	4,073	5,599	12,837
2008	4,694	9,071	961	3,373	5,656	12,444
2009	4,024	7,956	1,437	5,449	5,461	13,405
2010	3,929	7,828	1,151	4,160	5,080	11,988
2011	4,826	9,605	1,583	5,709	6,411	15,314
2012	4,237	8,110	1,066	3,699	5,303	11,809
2013	3,410	6,920	2,012	7,364	5,422	14,284
2014	3,662	6,891	1,026	3,692	4,688	10,583
2015	4,103	7,988	1,987	7,093	6,090	15,081
2016	3,524	6,674	1,355	4,936	4,879	11,609

Table 3c. Harvests of Atlantic Salmon in the subsistence and FSC Fisheries in Labrador (all areas), 2000-16.

Year	Small Number	Small Weight (kg)	Large Number	Large Weight (kg)	Total Number	Total Weight (kg)
2000	5,323	10,353	1,352	5,262	6,675	15,613
2001	4,789	9,789	1,673	6,499	6,478	16,288
2002	5,806	11,581	1,437	5,990	7,243	17,572
2003	6,477	13,196	2,175	8,912	8,653	22,108
2004	8,385	17,379	3,696	14,167	12,081	31,546
2005	10,436	21,038	2,817	10,876	13,253	31,914
2006	10,377	21,198	3,090	11,523	13,467	32,721
2007	9,208	17,070	2,652	9,386	11,860	26,456
2008	9,838	19,396	3,905	16,944	13,743	36,340
2009	7,988	16,130	3,344	13,681	11,332	29,810
2010	10,156	20,945	3,840	15,511	13,996	36,456
2011	11,301	23,442	4,533	18,535	15,834	41,979
2012	9,977	18,738	4,228	17,821	14,204	36,560
2013	7,164	14,674	6,374	25,299	13,539	39,973
2014	8,953	17,550	3,991	14,847	12,944	32,397
2015	8,923	17,500	6,146	24,935	15,069	42,435
2016	7,638	14,565	5,598	25,027	13,236	39,592

Table 4. Total returns of small Atlantic Salmon to rivers in NL 1984–2016.

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1984	-	-	-	-	19,028	-	1,081	1,675	1,534	-	-	-	-	-	-	1,805	235
1985	-	-	-	-	17,555	-	1,663	1,283	2,012	-	-	-	-	-	-	1,621	470
1986	-	-	-	-	10,343	-	1,064	1,547	1,459	-	-	-	-	8,302	-	3,155	528
1987	-	-	-	-	9,481	-	493	1,053	1,404	80	-	-	64	10,155	-	2,647	437
1988	-	-	-	-	9,496	-	1,562	1,337	2,114	313	-	-	65	7,627	-	2,388	422
1989	-	-	-	-	7,577	-	596	626	1,377	168	-	-	102	4,968	-	1,510	455
1990	-	-	-	-	6,995	-	345	1,070	1,518	401	-	-	158	5,368	-	2,518	444
1991	-	-	-	-	5,659	-	245	763	1,127	211	-	-	55	2,411	-	1,590	233
1992	-	-	-	-	13,508	-	1,168	1,563	1,780	237	-	-	104	2,523	888	2,829	480
1993	-	-	-	-	22,253	4,001	1,560	2,247	3,050	292	-	-	169	2,703	1,808	4,215	947
1994	-	-	-	2,180	17,603	2,857	968	1,751	1,809	158	-	-	73	1,533	1,791	3,737	954
1995	-	-	-	2,796	16,226	3,035	1,600	1,390	2,515	385	-	-	118	3,502	2,213	6,346	823
1996	-	-	-	3,319	30,425	3,208	946	2,044	2,251	356	-	-	674	4,440	1,798	7,475	1,230
1997	-	-	-	-	15,263	1,975	465	1,352	1,732	435	-	-	399	3,200	1,747	4,158	509
1998	-	110	-	-	27,093	3,275	1,295	2,625	1,868	423	-	-	264	2,931	1,659	5,388	1,718
1999	59	331	-	-	28,802	3,076	1,105	1,948	1,892	327	-	-	307	2,358	1,713	4,857	1,046
2000	367	-	-	-	12,063	1,798	742	1,749	1,629	277	-	-	564	5,177	1,271	4,154	1,492
2001	224	323	-		19,370	2,151	663	1,525	2,261	233	-	-	125	1,503	1,028	2,637	563
2002	190	235	106	3,141	15,589	1,974	714	916	1,435	276	-	-	487	2,573	1,640	4,861	1,465
2003	108	158	394	3,171	29,198	2,219	722	1,183	2,271	402	-	-	322	1,953	2,334	3,955	1,406
2004	56	615	454	4,008	27,195	2,726	983	1,520	3,006	169	-	-	656	3,818	2,828	5,110	1,151
2005	337	858	520	7,007	28,050	3,746	940	1,538	2,417	427	-	-	216	1,978	2,495	4,342	1,019
2006	484	326	445	4,967	24,924	2,768	741	1,173	2,546	352	-	-	136	2,623	3,004	4,030	1,300
2007	498	303	240	3,222	21,713	1,850	576	1,050	1,674	174	-	-	39	1,174	1,394	2,979	793
2008	428	495	474	4,842	31,990	3,998	1,416	2,328	3,586	695	-	-	71	2,823	3,614	5,886	1,920
2009	280	67	115	1,605	32,560	3,955	1,120	1,868	2,497	498	-	-	231	1,828	2,208	2,417	1,063
2010	306	173	*	2,225	39,417	3,790	1,480	2,798	4,183	941	-	-	271	1,762	3,175	4,794	1,782
2011	419	380	348	8,565	34,100	4,860	1,726	2,758	4,786	771	-	-	86	1,543	3,455	2,667	1,351
2012	423	225	*	3,599	25,113	3,755	1,434	2,708	3,745	430	-	-	65	1,965	1,930	3,839	1,173
2013	467	79	296	1,646	28,770	4,119	1,612	2,671	3,973	212	-	-	378	2,710	2,527	1,854	705

Table 4. Continued.

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2014	839	182	152	1,835	26,927	4,055	*	2,932	3,413	367	*	*	48	1,234	3,224	4,244	1,426
2015	734	305	556	2,625	28,185	4,016	1,391	3,589	4,596	128	638	661	99	2.276	4,220	5,614	1,612
2016	666	74	239	1,120	21,880	2,748	707	2,240	5,154	244	844	289	51	1,166	3,578	3,962	1,344
Pre-Moratorium Mean	-	-	-	2,765	10,767	-	881	1,169	1,568	235	590	-	89	6,472	-	2,154	403
Moratorium Mean	366	316	342	3,747	24,847	3,183	1,102	1,968	2,705	374	779	661	264	2,505	2,249	4,266	1,164
Previous Generation Mean	531	224	338	3,416	28,619	4,161	1,541	2,932	4,103	382	-	-	135	1,946	3,071	3,644	1,253

(1) English River, (2) Southwest Brook (Paradise River), (3) Muddy Bay Brook, (4) Sand Hill River, (5) Exploits River, (6) Campbellton River, (7) Salmon Brook (Gander River), (8) Middle Brook, (9) Terra Nova River, (10) Rocky River, (11) Northeast River (Placentia Bay), (12) Garnish River, (13) Little River, (14) Conne River, (15) Harry's River, (16) Torrent River, (17) Western Arm Brook

* no count in that year.

- no counting facility in operation.

Blank cells indicate no value available.

Pre-Moratorium Means: Labrador (1984-1997), Newfoundland (1984-1991)

Moratorium Means: Labrador (1998-2015), Newfoundland (1992-2015)

Previous Generation Means: Labrador (2010-2015), Newfoundland (2011-2015)

Table 5. Total returns of large Atlantic Salmon to rivers in NL 1984–2016.

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1984	-	-	-	-	529	-	38	57	107	-	-	-	-	-	-	288	0
1985	-	-	-	-	183	-	26	27	112	-	-	-	-	-	-	30	1
1986	-	-	-	-	355	-	12	15	140	-	-	-	-	412	-	93	0
1987	-	-	-	-	310	-	9	19	56	1	-	-	3	516	-	68	1
1988	-	-	-	-	147	-	24	14	206	6	-	-	3	420	-	44	1
1989	-	-	-	-	89	-	24	19	142	9	-	-	5	320	-	60	0
1990	-	-	-	-	122	-	8	13	144	17	-	-	15	372	-	82	0
1991	-	-	-	-	99	-	2	14	114	16	-	-	6	89	-	71	1
1992	-	-	-	-	314	-	101	43	270	46	-	-	21	159	16	170	8
1993	-	-	-	-	627	145	97	88	472	72	-	-	11	100	115	224	8
1994	-	-	-	730	916	191	93	91	243	19	-	-	11	100	128	334	31
1995	-	-	-	560	945	218	125	169	637	39	-	-	17	110	80	617	33
1996	-	-	-	414	2,057	560	112	161	467	45	-	-	127	179	126	517	50
1997	-	-	-	-	881	321	119	262	528	89	-	-	79	185	201	676	55
1998	-	4	-	-	1,959	402	141	196	394	130	-	-	49	294	191	761	128
1999	48	43	-	-	2,236	493	138	130	344	77	-	-	49	241	176	421	22
2000	15	-	-	-	684	208	61	190	232	104	-	-	52	216	49	596	120
2001	41	32	-	-	1,347	119	93	62	330	60	-	-	36	140	132	443	28
2002	31	34	11	561	890	123	95	69	271	78	-	-	41	167	285	432	48
2003	19	16	31	627	1,336	152	139	74	330	73	-	-	13	51	422	341	23
2004	25	54	28	604	949	161	72	88	397	235	-	-	31	175	498	549	74
2005	28	54	20	875	1,967	276	138	62	316	95	-	-	15	105	453	780	43
2006	44	35	17	568	3,365	328	102	115	438	56	-	-	26	170	680	1,431	44
2007	42	32	14	693	3,956	487	62	141	241	35	-	-	8	49	289	519	17
2008	51	35	36	795	4,577	432	98	143	429	56	-	-	3	144	414	1,309	15
2009	105	13	10	723	5,579	433	52	85	224	34	-	-	1	67	371	1,400	21
2010	50	17	*	320	7,060	495	100	115	468	30	-	-	6	91	452	1,282	47
2011	156	33	19	970	7,724	583	120	195	501	39	-	-	1	74	569	1,737	75
2012	82	32	*	739	5,578	548	100	173	452	30	-	-	4	71	318	470	93
2013	160	63	36	1271	4,922	484	90	699	391	31	-	-	9	91	416	1,621	73
2014	190	38	22	587	2,895	478	*	424	535	41	-	-	0	56	531	565	35
2015	258	58	45	1104	3351	479	327	425	684	19	114	39	0	127	695	641	22

Table 5. Continued.

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2016	208	31	18	977	2,318	223	263	320	483	35	101	18	1	66	817	917	114
Pre-Moratorium Mean	-	-	-	568	229	-	18	22	128	10	20	-	6	355	-	92	1
Moratorium Mean	79	37	24	746	2,755	253	111	175	400	64	125	-	25	132	317	743	46
Previous Generation Mean	149	40	31	832	4,895	514	159	383	513	32	-	-	3	84	506	1,007	60

(1) English River, (2) Southwest Brook (Paradise River), (3) Muddy Bay Brook, (4) Sand Hill River, (5) Exploits River, (6) Campbellton River, (7) Salmon Brook (Gander River), (8) Middle Brook, (9) Terra Nova River, (10) Rocky River, (11) Northeast River (Placentia Bay), (12) Garnish River, (13) Little River, (14) Conne River, (15) Harry's River, (16) Torrent River, (17) Western Arm Brook

* no count in that year.

- no counting facility in operation.

Blank cells indicate no value available.

Pre-Moratorium Means: Labrador (1984-1997), Newfoundland (1984-1991)

Moratorium Means: Labrador (1998-2015), Newfoundland (1992-2015)

Previous Generation Means: Labrador (2010-2015), Newfoundland (2011-2015)

Table 6a Percentage conservation requirement achieved for rivers in Labrador 1994–2016. (no data available; - no facility in operation)*

River	English River	Southwest Brook (Paradise River)	Muddy Bay Brook	Sand Hill River
1994	-	-	-	65
1995	-	-	-	70
1996	-	-	-	74
1997	-	-	-	-
1998	-	39	-	-
1999	40	139	-	-
2000	73	-	-	-
2001	63	110	-	-
2002	52	82	43	81
2003	26	52	153	82
2004	26	201	173	101
2005	80	267	190	168
2006	115	110	161	118
2007	115	102	90	89
2008	109	157	184	125
2009	117	26	46	59
2010	88	57	*	54
2011	176	124	130	204
2012	129	80	*	98
2013	188	57	125	82
2014	275	72	66	59
2015	298	117	218	95
2016	255	38	93	60

Table 6b Percentage conservation requirement achieved for rivers in insular Newfoundland 1994–2016.

River	Exploits River	Lower	Middle	Upper	Campbellton River	Salmon Brook (Gander River)	Middle Brook	Terra Nova River	Rocky River	Northeast River Placentia Bay	Garnish R.	Little River	Conne River	Harry's River	Torrent R.	Western Arm Brook
1994	31	103	18	7	216	103	176	25	25	-	-	37	67	51	530	292
1995	39	121	24	12	264	151	116	44	56	-	-	56	145	53	1033	286
1996	69	210	43	26	316	105	258	35	34	-	-	288	206	46	1279	415
1997	24	72	15	10	180	62	193	31	56	-	-	200	135	50	797	200
1998	47	134	35	6	315	142	301	33	54	-	-	231	151	49	924	625
1999	44	116	35	7	312	124	222	33	39	-	-	38	122	49	680	370
2000	21	56	16	2	152	86	217	27	34	-	-	263	188	29	657	567
2001	34	91	27	5	148	94	132	36	33	-	-	69	77	33	400	193
2002	25	56	23	3	138	100	101	28	40	-	-	224	110	60	597	510
2003	51	141	39	7	191	114	134	42	50	-	-	144	76	84	496	466
2004	47	130	37	2	212	145	162	54	51	-	-	293	174	98	686	425
2005	49	83	51	4	328	134	163	42	55	-	-	99	92	89	675	355
2006	48	125	40	1	273	87	133	47	42	-	-	69	110	116	844	446
2007	44	150	27	2	208	72	126	29	22	-	-	20	55	55	458	258
2008	60	111	60	5	360	148	232	61	76	-	-	31	117	119	1203	611
2009	62	154	53	2	371	127	172	40	54	-	-	98	72	95	750	341
2010	77	175	70	5	386	171	266	70	96	-	-	119	69	100	1050	751
2011	70	151	65	3	498	201	275	79	81	-	-	37	61	112	867	458
2012	50	61	56	18	404	164	303	64	45	-	-	30	79	68	689	405
2013	57	106	57	7	399	184	374	64	25	-	-	169	101	78	802	266
2014	50	18	69	9	409	*	363	61	42	-	-	21	49	137	714	510
2015	48	11	68	5	385	199	429	82	15	403	65	42	110	148	898	425
2016	37	41	44	3	245	117	276	86	29	438	20	22	56	125	677	502

* no count in that year.
- indicate no counting facility in operation

Table 7. Atlantic Salmon smolt production in NL rivers 1971–2016.

Year	Campbellton River (SFA 4)	Rocky River (SFA 9)	Garnish River (SFA 11)	Conne River (SFA 11)	Western Arm Brook (SFA 14A)
1971	-	-	-	-	5,735
1972	-	-	-	-	11,905
1973	-	-	-	-	8,484
1974	-	-	-	-	11,854
1975	-	-	-	-	9,600
1976	-	-	-	-	6,232
1977	-	-	-	-	9,899
1978	-	-	-	-	13,071
1979	-	-	-	-	8,349
1980	-	-	-	-	15,665
1981	-	-	-	-	13,981
1982	-	-	-	-	12,477
1983	-	-	-	-	10,552
1984	-	-	-	-	20,653
1985	-	-	-	-	13,417
1986	-	-	-	-	17,719
1987	-	-	-	74,585	17,029
1988	-	-	-	65,692	15,321
1989	-	-	-	73,724	11,407
1990	-	8,287	-	56,943	10,563
1991	-	7,732	-	74,645	13,453
1992	-	7,813	-	68,208	15,405
1993	31,577	5,115	-	55,765	13,435
1994	41,663	9,781	-	60,762	9,283
1995	39,715	7,577	-	57,733	15,144
1996	58,369	14,261	-	94,088	14,502
1997	62,050	16,900	-	100,983	23,845
1998	50,499	12,163	-	69,841	17,139
1999	47,256	8,625	-	63,658	13,500
2000	35,596	7,616	-	60,777	12,706
2001	37,170	9,392	-	86,898	16,013
2002	32,630	10,144	-	81,806	14,999
2003	35,089	4,440	-	71,479	12,086
2004	32,780	13,047	-	79,667	17,323
2005	30,123	15,847	-	66,196	8,607
2006	33,304	13,200	-	35,146	20,826
2007	35,742	12,355	-	63,738	16,621
2008	40,390	18,338	-	68,242	17,444
2009	36,705	14,041	-	71,085	18,492
2010	41,069	15,098	-	54,392	19,044
2011	37,033	9,311	-	50,701	20,544
2012	44,193	5,673	-	51,220	13,573
2013	40,355	6,989	-	66,261	19,710
2014	45,630	9,901	-	56,224	19,771
2015	32,785	6,454	-	32,557	14,278
2016	44,747	4,542	2585	*	12,255
Previous 5-year mean (2011-15)	39,994	7,666	-	51,393	17,575

* No smolt count available
- No counting facility in operation

Table 8. Percent marine survival of Atlantic Salmon smolt (year-1) to small adult salmon (year) in NL rivers 1972-2014. (Dash indicates that no counting facility was in operation.)

Year	Campbellton River (SFA 4)	Rocky River (SFA 9)	Conne River (SFA 11)	Western Arm Brook (SFA 14A)
1972	-	-	-	7.1
1973	-	-	-	6.7
1974	-	-	-	6.0
1975	-	-	-	5.4
1976	-	-	-	5.8
1977	-	-	-	6.0
1978	-	-	-	3.2
1979	-	-	-	12.1
1980	-	-	-	5.6
1981	-	-	-	3.1
1982	-	-	-	3.3
1983	-	-	-	9.1
1984	-	-	-	2.2
1985	-	-	-	2.3
1986	-	-	-	3.9
1987	-	-	-	2.5
1988	-	-	10.2	2.5
1989	-	-	7.6	3.0
1990	-	-	7.3	3.9
1991	-	2.5	4.2	2.2
1992	-	3.1	3.4	3.6
1993	-	3.7	4.0	6.1
1994	9.0	3.1	2.7	7.1
1995	7.3	3.9	5.8	8.9
1996	8.1	4.7	7.2	8.1
1997	3.4	3.1	3.4	3.5
1998	5.3	2.5	2.9	7.2
1999	6.1	2.7	3.4	6.1
2000	3.8	3.2	8.1	11.1
2001	6.0	3.1	2.5	4.4
2002	5.3	2.9	3.0	9.1
2003	6.8	4.0	2.4	9.4
2004	7.8	3.8	5.3	9.5
2005	11.4	3.3	2.5	5.9
2006	9.2	2.2	4.0	15.1
2007	5.6	1.3	3.3	3.8
2008	11.2	5.6	4.4	11.6
2009	9.8	2.7	2.7	6.1
2010	10.3	6.7	2.5	9.6
2011	11.8	5.1	2.8	7.1
2012	10.1	4.6	3.9	5.7
2013	9.3	3.7	5.3	5.2
2014	10.0	5.3	1.9	7.2
2015	8.8	1.3	4.0	8.1
2016	8.4	3.8	3.6	9.4
Previous 5year mean (2011-15)	10.0	4.0	3.6	6.7

FIGURES

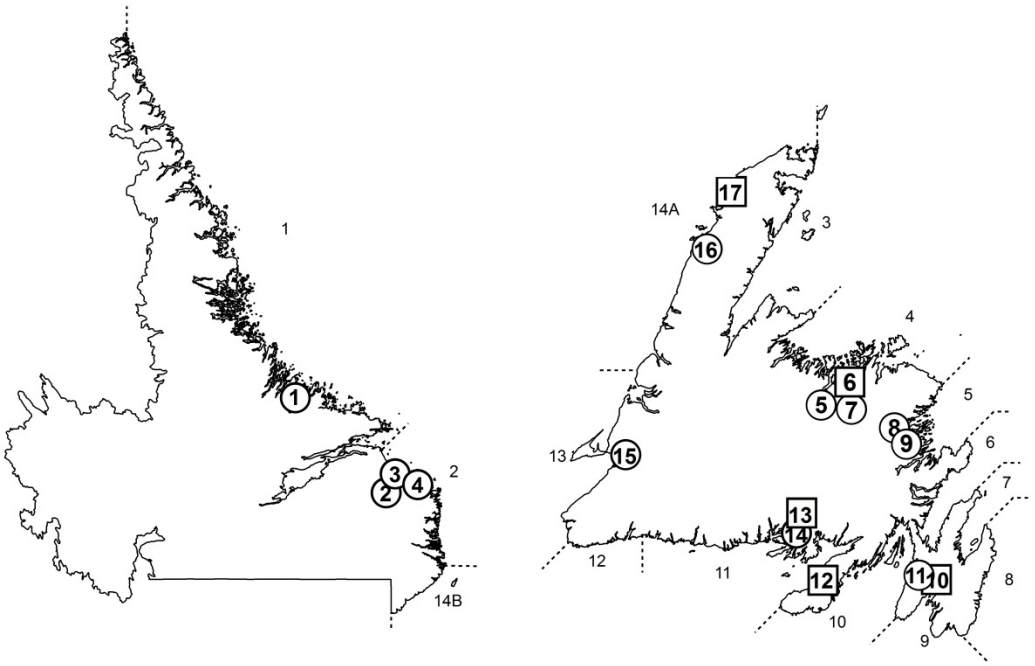


Figure 1. Map showing the locations of rivers in SFAs 1–14B where Atlantic Salmon populations were monitored in 2016: (1) English River, (2) Southwest Brook, Paradise River, (3) Muddy Bay Brook, (4) Sand Hill River, (5) Exploits River, (6) Campbellton River, (7) Salmon Brook [Gander River], (8) Middle Brook, (9) Terra Nova River, (10) Rocky River, (11) Northeast River, Placentia Bay, (12) Garnish River, (13) Little River, (14) Conne River, (15) Harry's River, (16) Torrent River, (17) Western Arm Brook. Adult counts (circles); Adult and smolt counts (squares); SFA boundary (dotted line).

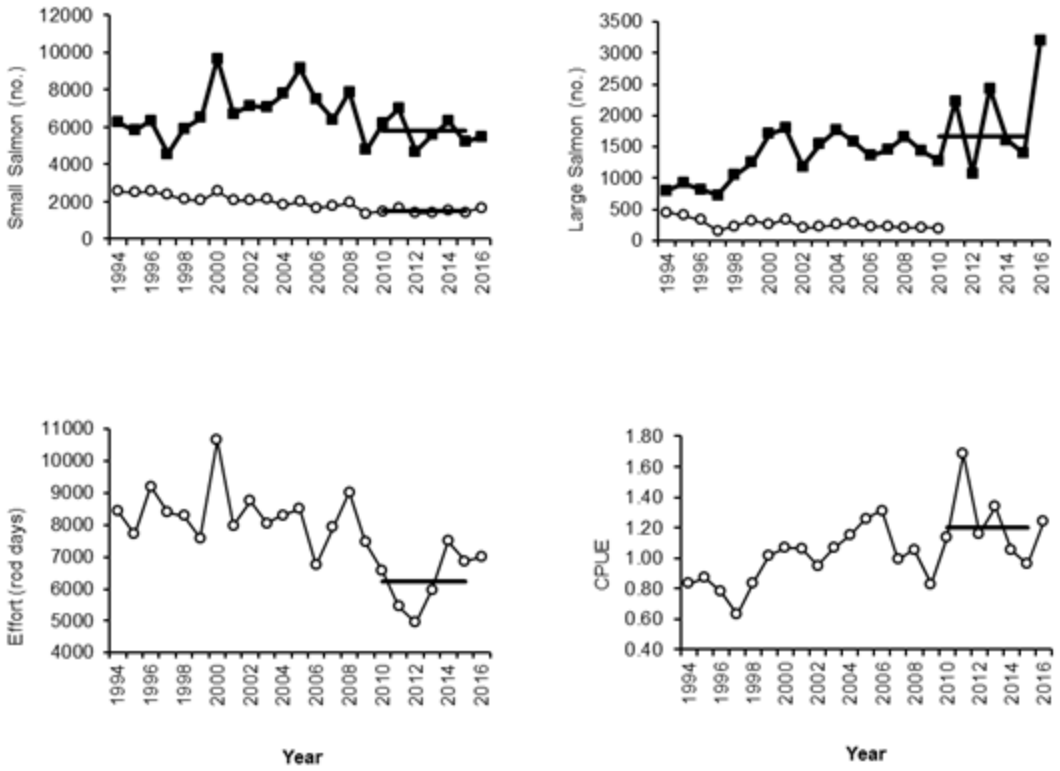


Figure 2. Recreational catch of small and large salmon (open circles – retained salmon, black squares – retained and released salmon), effort, and CPUE, 1994–2016 for Labrador (SFAs 1, 2, 14B). Horizontal lines represent the previous generation mean, 2010–15.

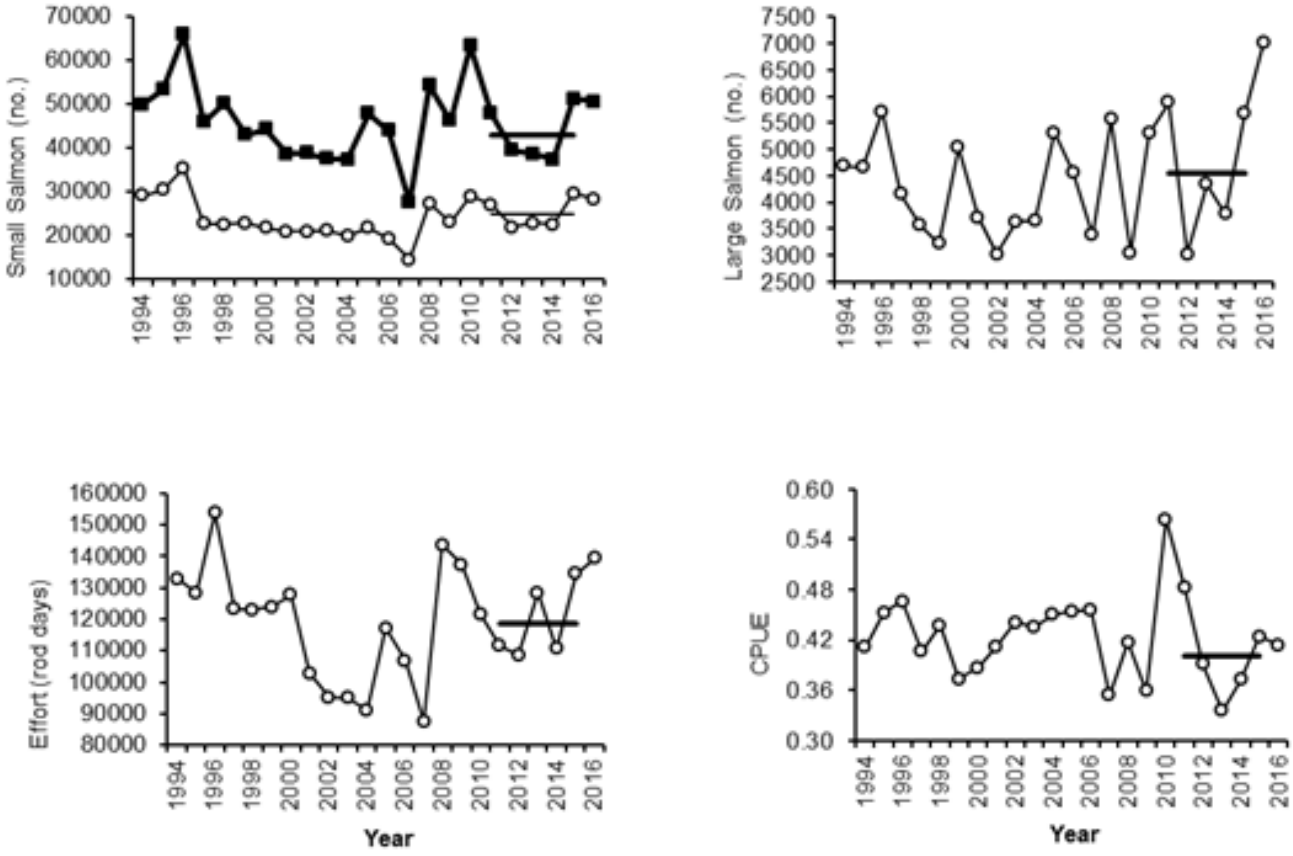


Figure 3. Recreational catch of small and large salmon (open circles – retained salmon, black squares – retained and released salmon), effort, and CPUE, 1994-2016 for Newfoundland (SFAs 3-14A). Horizontal lines represent the previous generation mean, 2011–15.

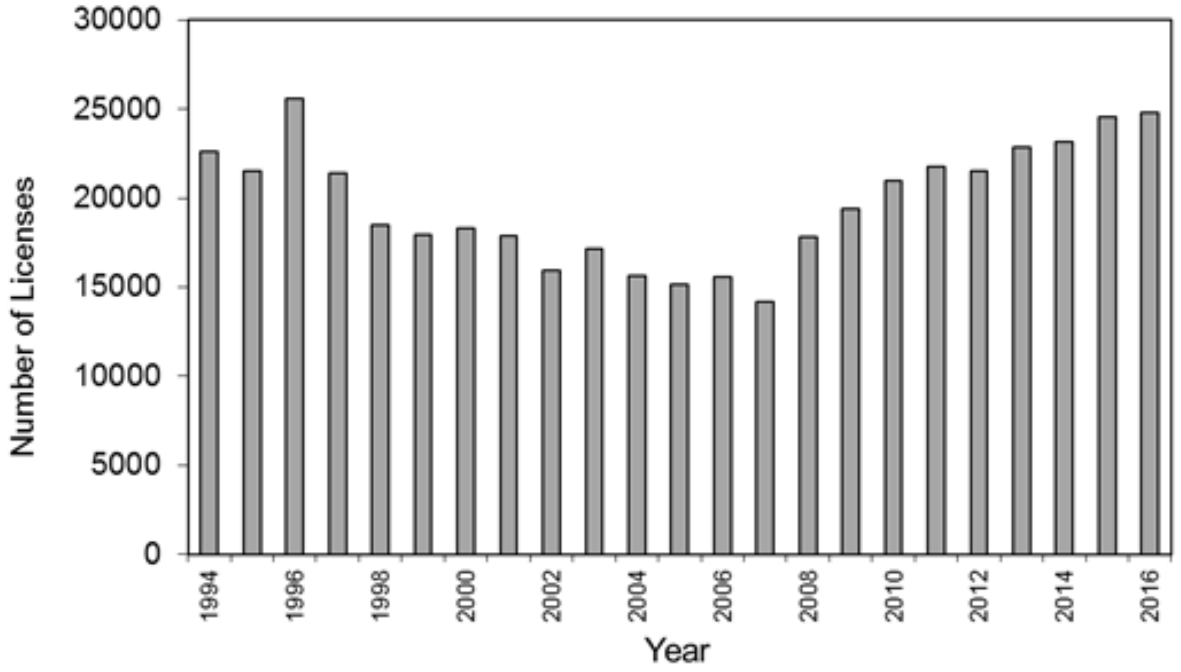
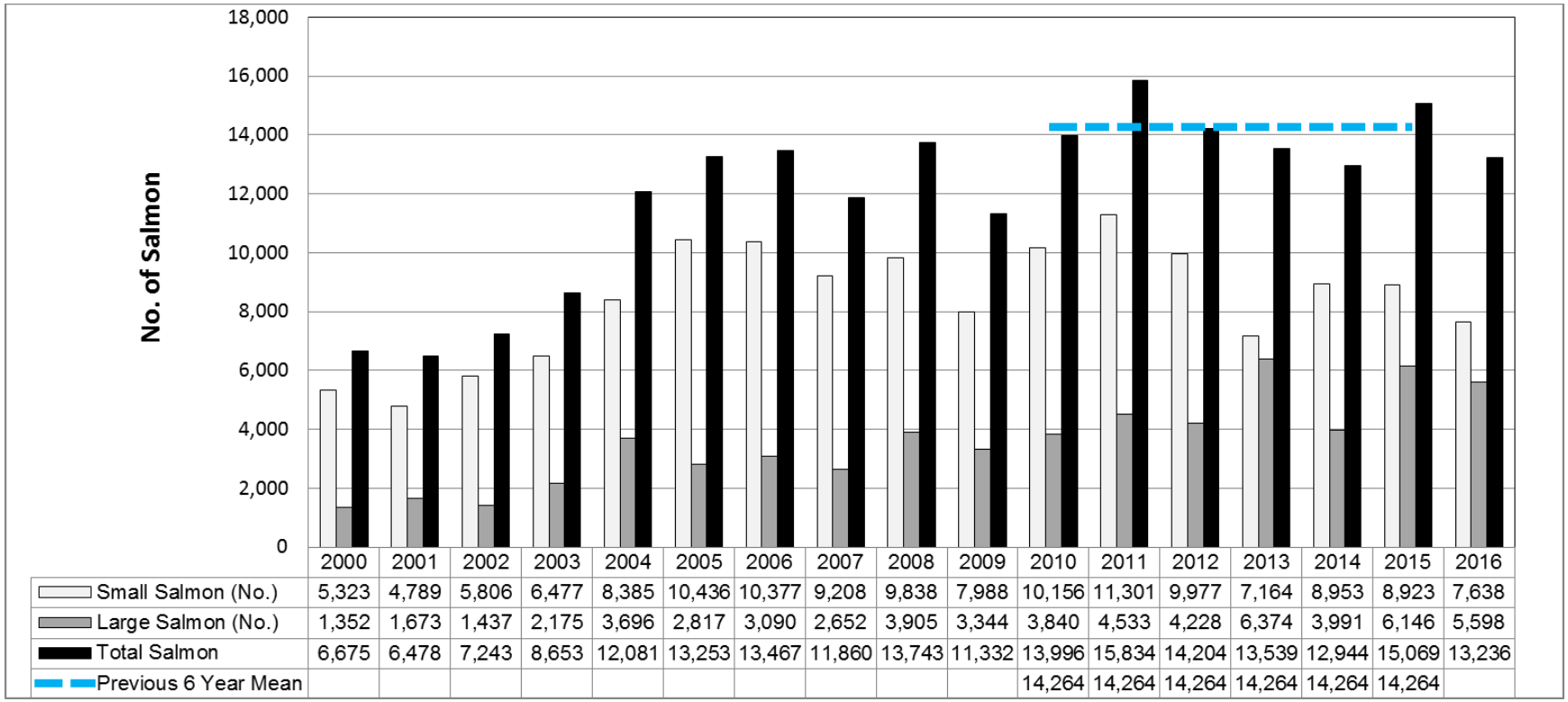
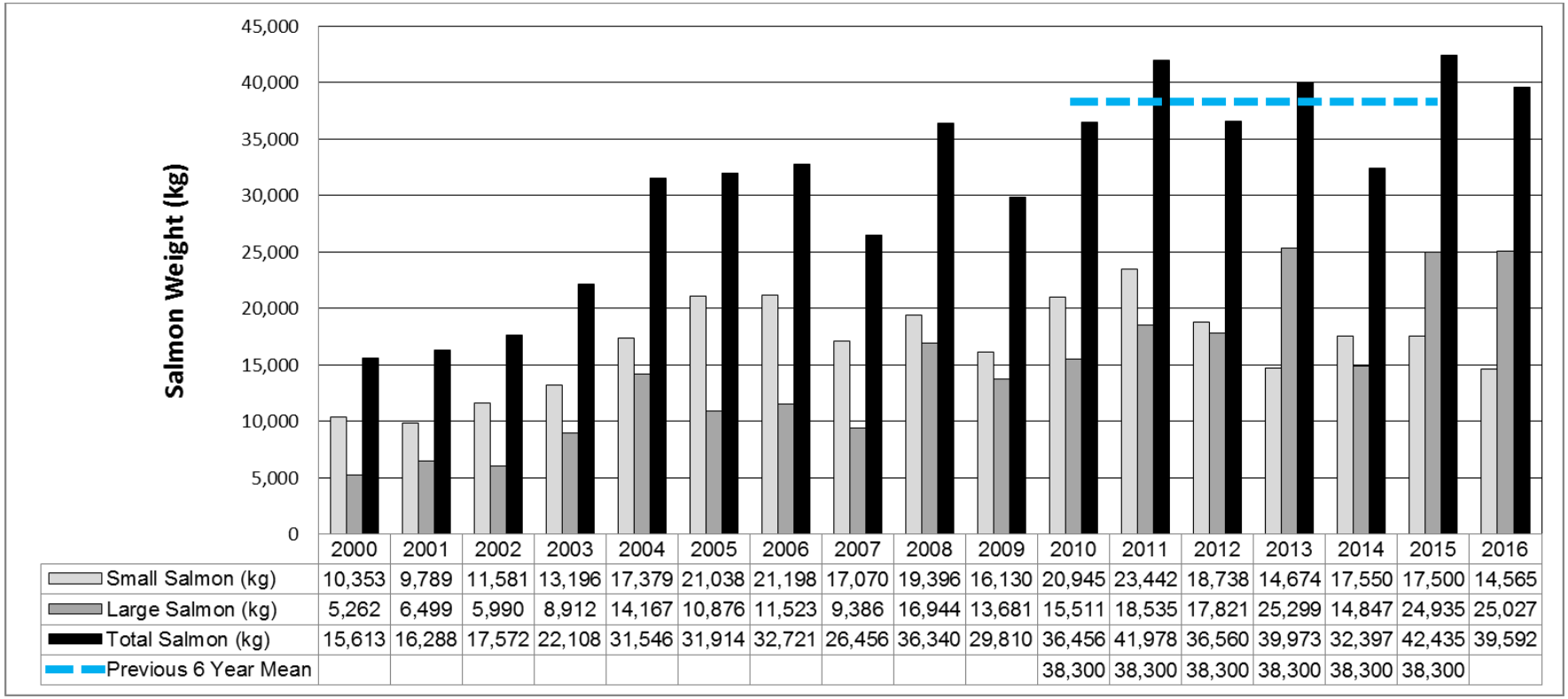


Figure 4. Number of Recreational Atlantic Salmon licences sold in NL (1994-2016).



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Small Salmon (No.)	5,323	4,789	5,806	6,477	8,385	10,436	10,377	9,208	9,838	7,988	10,156	11,301	9,977	7,164	8,953	8,923	7,638
Large Salmon (No.)	1,352	1,673	1,437	2,175	3,696	2,817	3,090	2,652	3,905	3,344	3,840	4,533	4,228	6,374	3,991	6,146	5,598
Total Salmon	6,675	6,478	7,243	8,653	12,081	13,253	13,467	11,860	13,743	11,332	13,996	15,834	14,204	13,539	12,944	15,069	13,236
Previous 6 Year Mean											14,264	14,264	14,264	14,264	14,264	14,264	

Figure 5a. Harvest by number of small (white bars), large (grey bars), and total (black bars) Atlantic Salmon in the subsistence and FSC Fisheries in Labrador (SFAs 1 and 2).



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Small Salmon (kg)	10,353	9,789	11,581	13,196	17,379	21,038	21,198	17,070	19,396	16,130	20,945	23,442	18,738	14,674	17,550	17,500	14,565
Large Salmon (kg)	5,262	6,499	5,990	8,912	14,167	10,876	11,523	9,386	16,944	13,681	15,511	18,535	17,821	25,299	14,847	24,935	25,027
Total Salmon (kg)	15,613	16,288	17,572	22,108	31,546	31,914	32,721	26,456	36,340	29,810	36,456	41,978	36,560	39,973	32,397	42,435	39,592
Previous 6 Year Mean											38,300	38,300	38,300	38,300	38,300	38,300	

Figure 5b. Harvest by weight (kg) of small (white bars), large (grey bars), and total (black bars) Atlantic Salmon in the subsistence and FSC Fisheries in Labrador (SFAs 1 and 2).

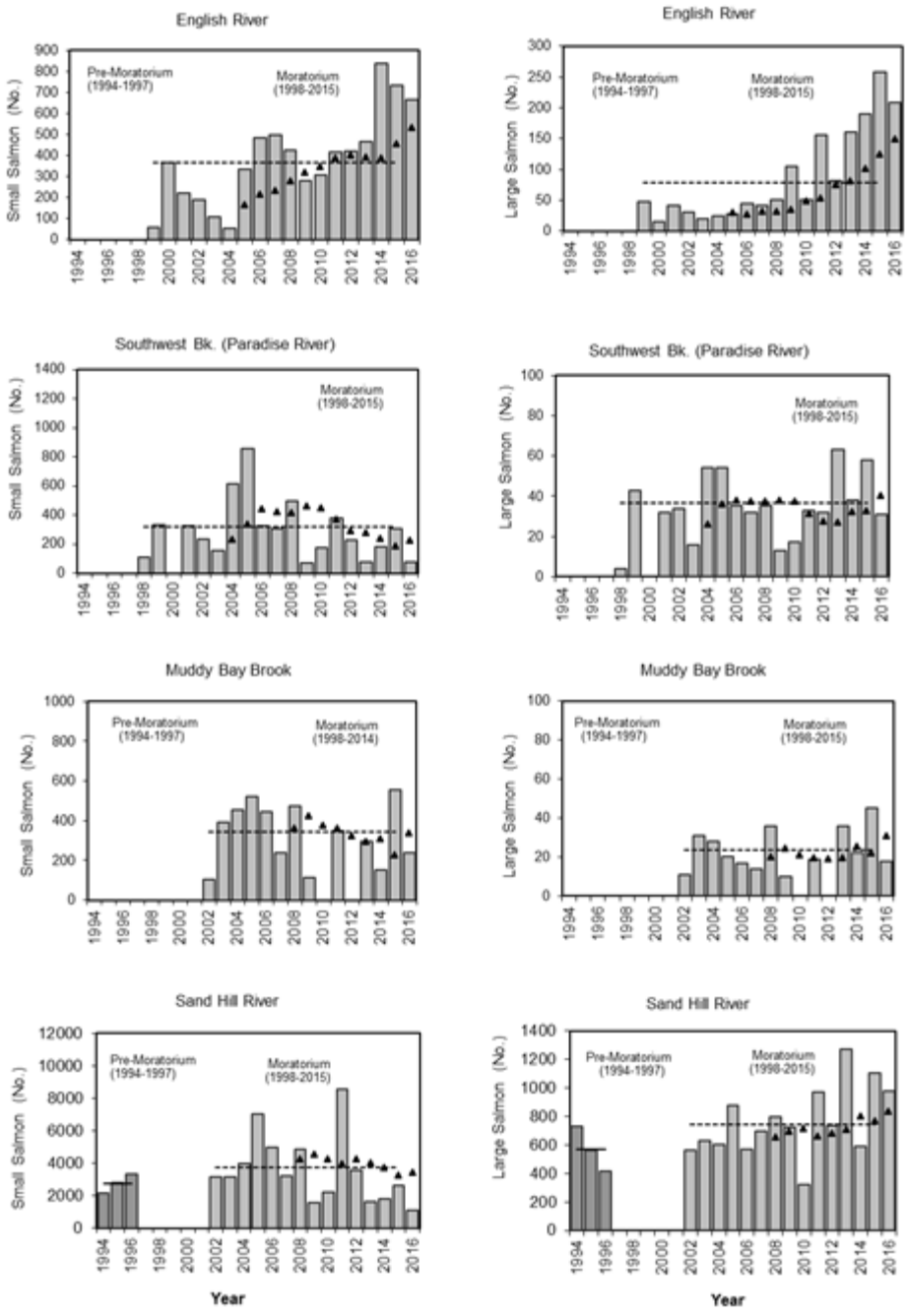


Figure 6. Total returns of small and large salmon to Labrador rivers: English River (SFA 1), Southwest Brook, Paradise River (SFA 2), Muddy Bay Brook (SFA 2) and Sand Hill River (SFA 2). The horizontal solid line represents the pre-moratorium mean 1984-97, the dotted line the moratorium mean 1998-2015 and the triangles the previous six-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years. Note: No data was available for Muddy Bay Brook in 2010 and 2012.

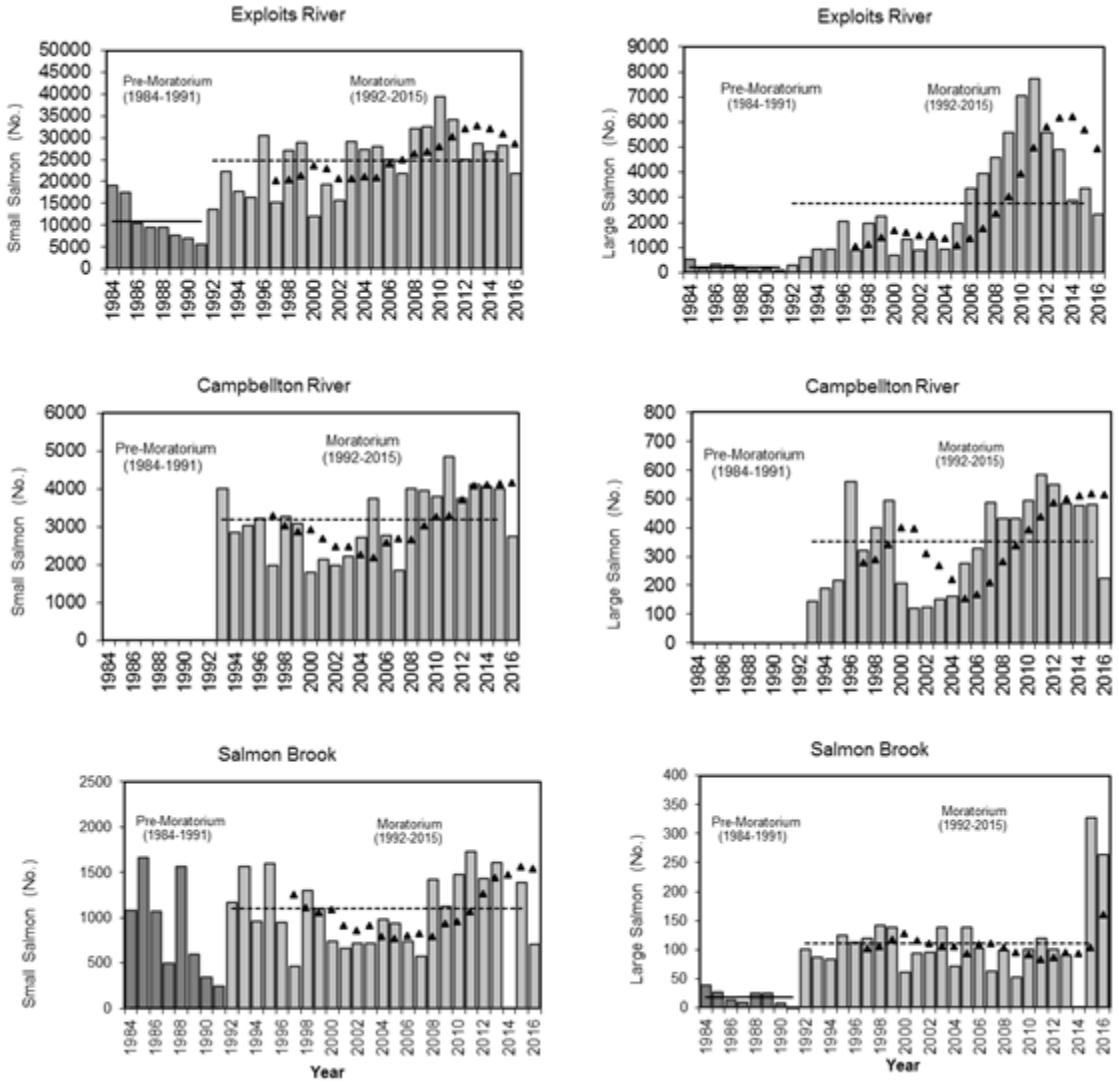


Figure 7. Total returns of small and large salmon to SFA 4 rivers on the northeast coast of Newfoundland: Exploits River, Campbellton River, and Salmon Brook. The horizontal solid line represents the pre-moratorium mean 1984-91, the dotted line the moratorium mean 1992-2013 and the triangles the previous five-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years. Note: No data was available for Salmon Brook in 2014.

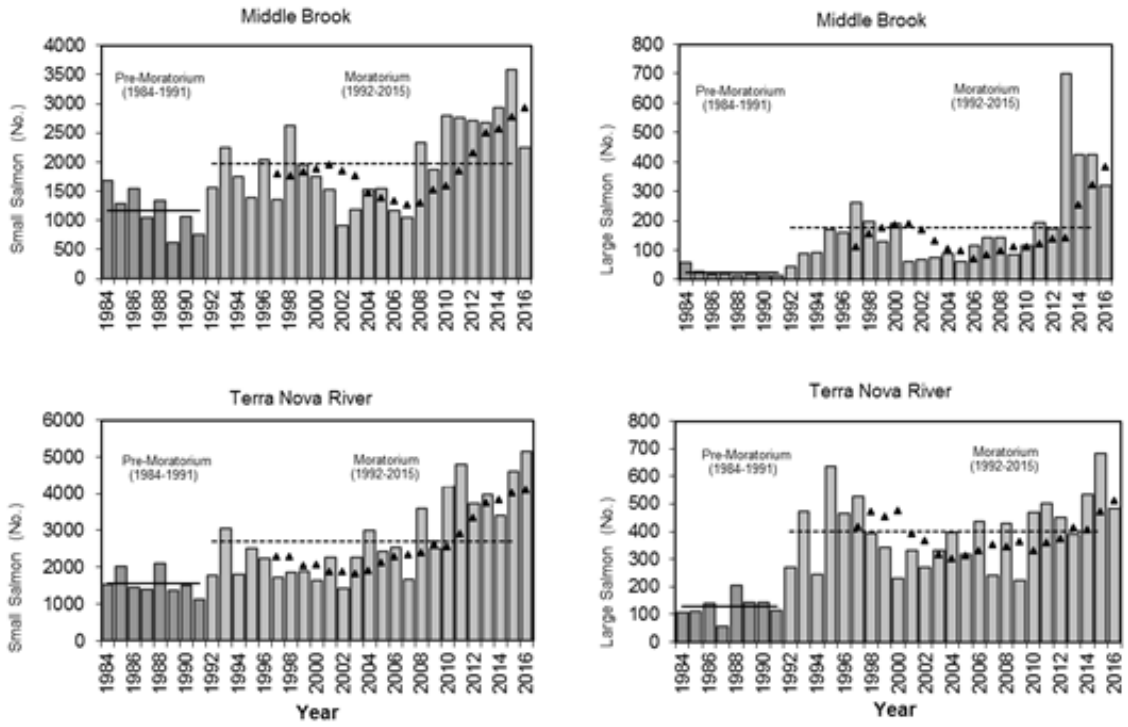


Figure 8. Total returns of small and large salmon to SFA 5 rivers on the northeast coast of Newfoundland: Middle Brook and Terra Nova River. The horizontal solid line represents the pre-moratorium mean 1984-91, the dotted line the moratorium mean 1992-2015 and the triangles the previous five-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years.

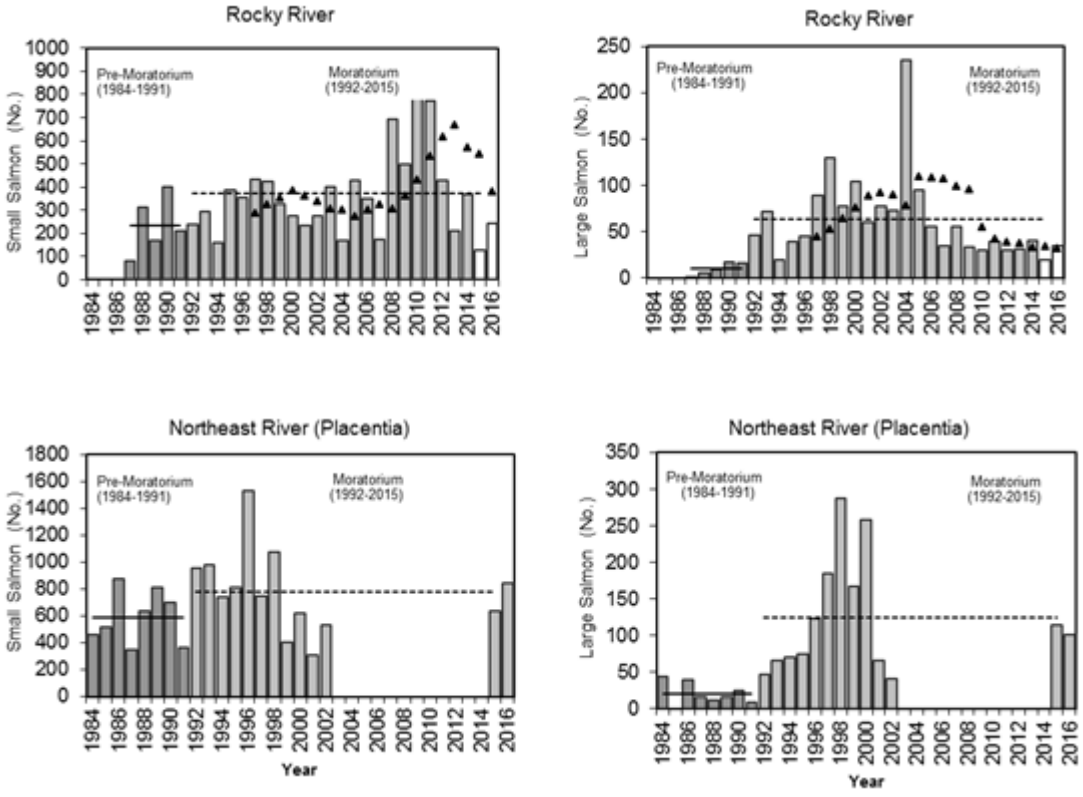


Figure 9. Total returns of small and large salmon to rivers on the south coast of Newfoundland: Rocky River (SFA 9), Northeast River (Placentia Bay) (SFA 10. The horizontal solid line represents the pre-moratorium mean 1984-91, the dotted line the moratorium mean 1992-2015 and the triangles the previous five-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years. Note: Fishway on Rocky River was under repair in 2015 and 2016.

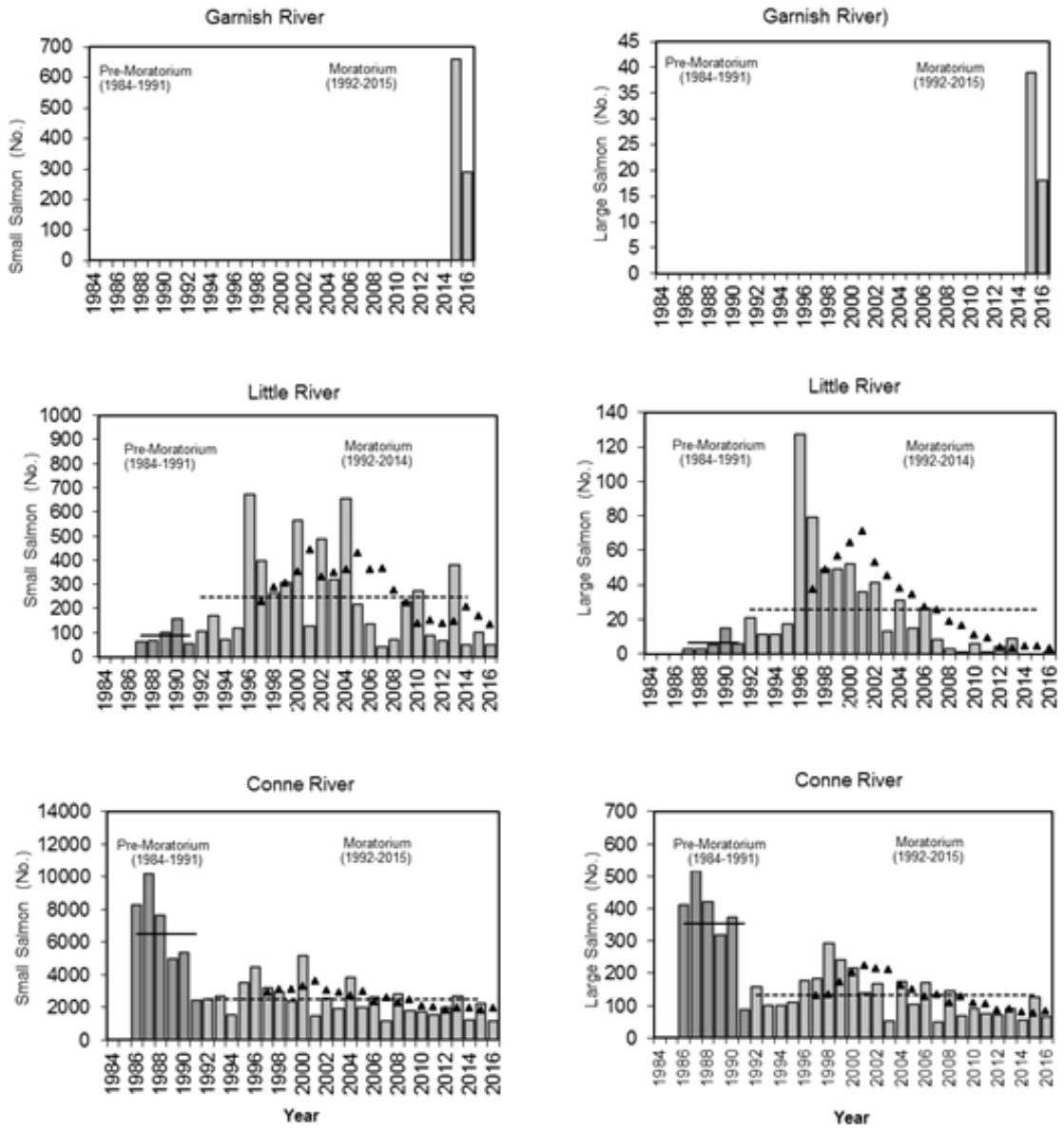


Figure 10. Total returns of small and large salmon to SFA 11 rivers on the south coast of Newfoundland: Garnish River, Little River, and Conne River. The horizontal solid line represents the pre-moratorium mean 1984-91, the dotted line the moratorium mean 1992-2015 and the triangles the previous five-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years.

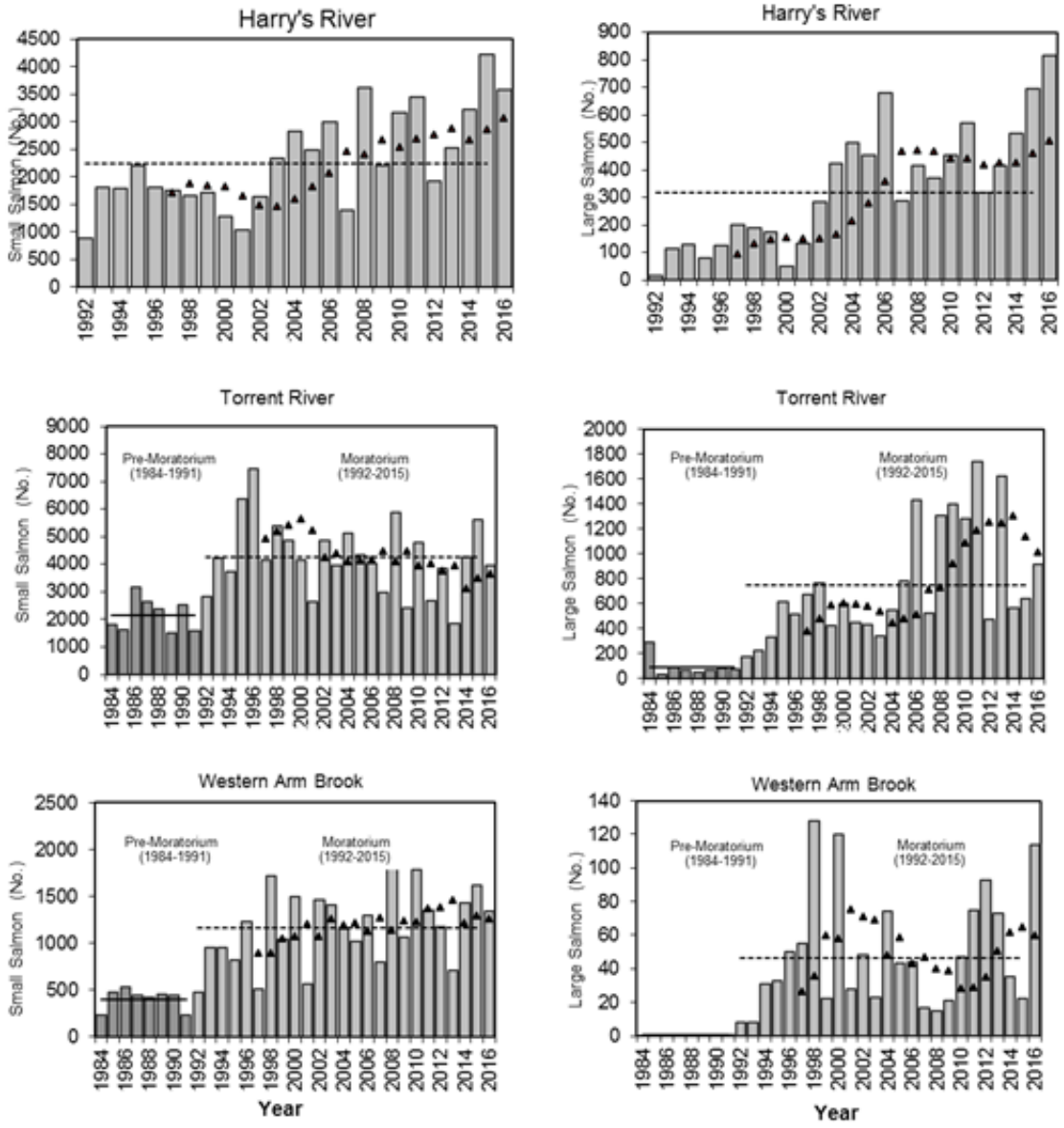


Figure 11. Total returns of small and large salmon to rivers on the west coast of Newfoundland: Harry's River (SFA 13), Torrent River (SFA 14A), and Western Arm Brook (SFA 14A). The horizontal solid line represents the pre-moratorium mean 1984-91, the dotted line the moratorium mean 1992-2015 and the triangles the previous five-year mean. The dark gray bars are the pre-moratorium years and the lighter gray bars the moratorium years. Note: Enumeration of salmon on Harry's Rivers is carried out using a DIDSON sonar camera. Number of large salmon is estimated based on the percent large sonar images in a subsample of the run.

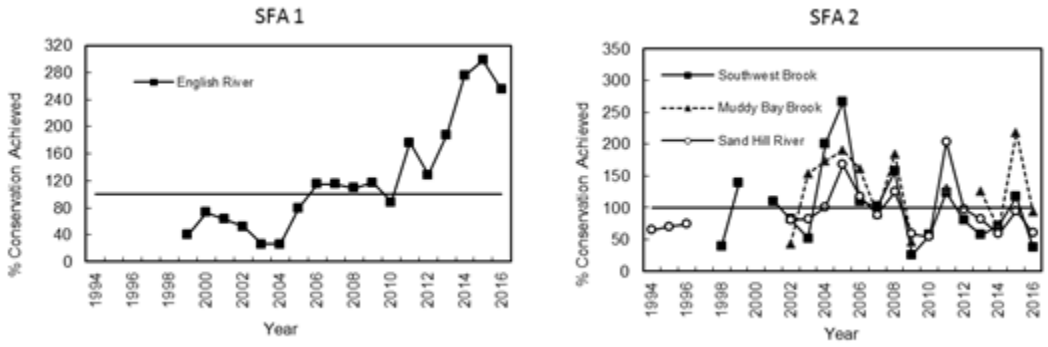


Figure 12. Percent of conservation egg requirement achieved for Labrador for data available from 1994–2016. Horizontal line represents 100% of conservation requirement.

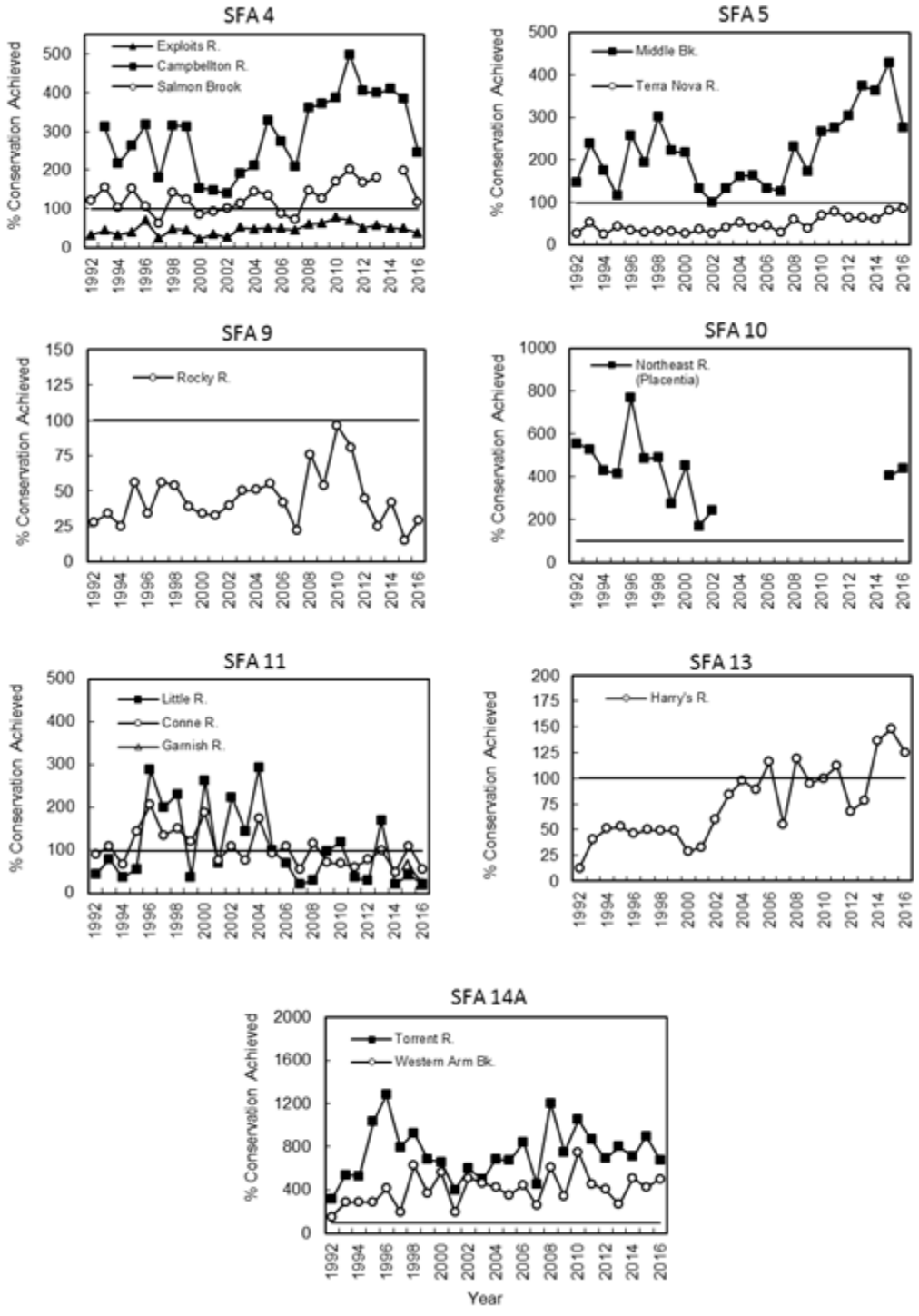


Figure 13. Percent of conservation egg requirement achieved for insular Newfoundland for data available from 1992–2016. Horizontal line represents 100% of conservation requirement.

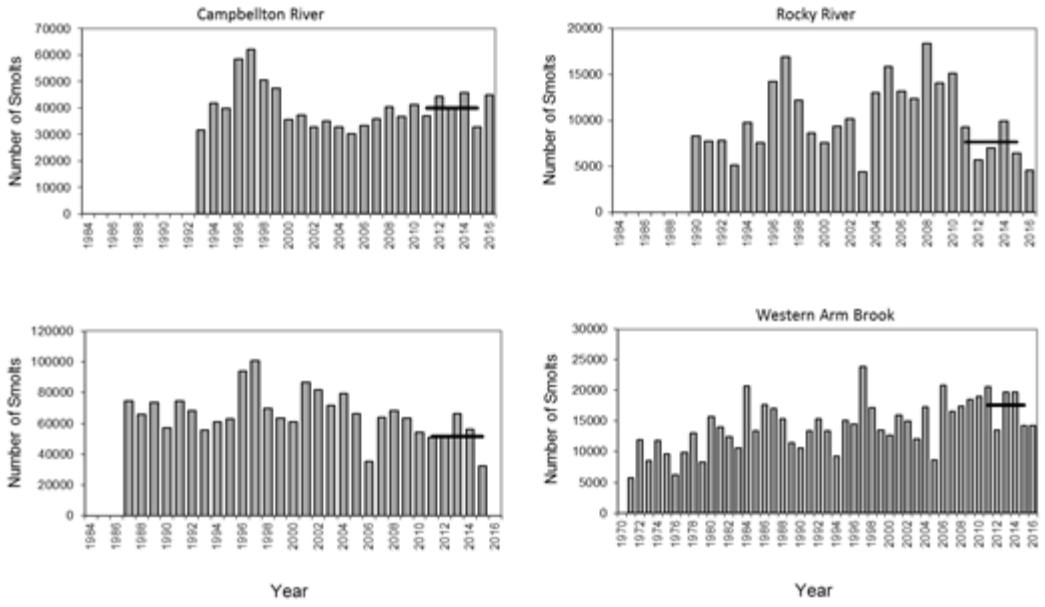


Figure 14. Atlantic Salmon smolt production (bars) of four rivers in Newfoundland. Horizontal black line represents previous five-year mean (2011-15). Note: no smolt count was obtained for Conne River in 2016.

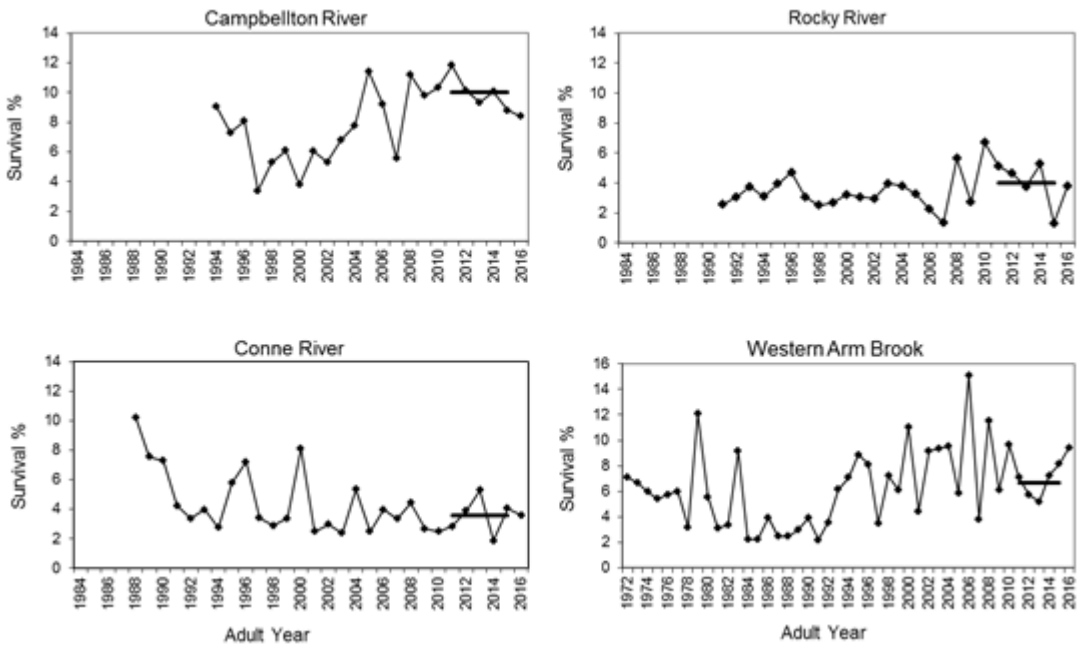


Figure 15. Marine survival of Atlantic Salmon smolt (diamonds) to small adult salmon. Horizontal black line represents previous five-year generation mean.

APPENDIX I

Documentation supporting the decision to re-open the 5-year Atlantic Salmon management plan.

Trigger document

In 2014, the Department began implementing a 5-year management plan for Atlantic Salmon in the NL Region. Although management measures outlined in this plan are expected to remain the same over this 5 year period, changes could be warranted if there was a dramatic change in salmon stocks, particularly declines. To this end, Science was asked by Resource Managers to identify 'triggers/indicators' that would warrant revisiting the salmon management plan earlier than the planned 5 years. Thus, these triggers mainly reflect significant conservation concerns related to the health and abundance of salmon stocks within the region.

If 'triggers' were met, it is our understanding that this would mean reconvening the Salmon Advisory Committee (SAC) and depending on the circumstances, might also involve holding a Regional Advisory Process (RAP).

There are basically two scenarios where Science would 'trigger' revisiting the 5-year plan earlier:

1. >30% decline in total returns on ≥50% of our monitored rivers in any given year; or
2. >25% decline in total returns on ≥50% of our monitored rivers in 2 consecutive years.

For both these scenarios, Science will conduct an in-house review to consider other factors such as:

- River population size (i.e., whether < 500 or > 500 individuals as much more variability in rivers with smaller returns);
- Continuous decline on same exact rivers over 2-year period; and
- Geographic patterns.

And all comparisons will be made using both the previous 5-year mean (shorter-term trends) as well as the previous 10-year mean (longer-term trends).

With respect to dramatic changes involving **increases** in stock abundance, rather than declines, it was felt 5 years was a reasonable time frame when considering management changes that might result in increased harvests. This is mainly due to the inherent year-to-year variability on most rivers and taking a precautionary approach. It is important to note that any changes involving increased harvests would require an in-season review during the year of the proposed change.

Table A1: Comparison of 2016 estimated total returns to recent five-year means.

SFA	River	2016 Estimated Total Returns Small	2016 Estimated Total Returns Large	2016 Estimated Total Returns Small + Large	5-Year Average Small	5-Year Average Large	5-Year Average Total	Percent Difference Small	Percent Difference Large	Percent Difference Total
4	Exploits River	21734	2319	24053	28594	4901	33495	-24.0	-52.7	-28.2
4	Campbellton River	2748	223	2971	4161	514	4675	-34.0	-56.6	-36.4*
4	Salmon Brook	688	262	950	1541	159	1700	-55.4	64.8	-44.1*
5	Middle Brook	2319	320	2639	2932	383	3315	-20.9	-16.4	-20.4
5	Terra Nova River	5220	481	5701	4103	513	4616	27.2	-6.2	23.5
11	Conne River	1158	66	1224	1946	84	2030	-40.5	-21.4	-39.7*
11	Little River	-	-	34	-	-	138	-	-	-75.4*
13	Harry's River	3748	617	4365	3071	505	3576	22.0	22.2	22.1
14A	Torrent River	3643	903	4546	3641	1007	4648	0.1	-10.3	-2.2
14A	Western Arm Brook	1344	114	1458	1253	60	1313	7.3	90.0	11.0
1	English River	613	189	802	576	169	745	6.4	11.8	7.7
2	Sand Hill River	1122	974	2096	2426	925	3351	-53.8	5.3	-37.5*
2	Muddy Bay Brook	239	18	257	338	31	369	-29.3	-41.9	-30.4*
2	Paradise River	74	31	105	234	45	279	-68.4	-31.1	-62.4*

* show the 7 rivers that triggered the re-opening of the management plan.