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Labrador Subsistence Food Fisheries – Mixed-Stock Fisheries Context

(Tabled by Canada)

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EXECUTIVE SUMMARY

- The Atlantic salmon subsistence fisheries in Labrador take place in estuaries and coastal areas using gillnets and are considered to be mixed-stock fisheries. The majority of the salmon harvests in these fisheries take place in fishing locations categorized as estuaries with a reduced potential to intercept salmon from non-local stocks.
- The management of these fisheries includes a number of conditions related to gear, seasons, weekly fishery closures, carcass tagging of harvested salmon, a logbook program for reporting catches, a limit on total harvest using tags, and a prohibition on sales of Atlantic salmon.
- Reported annual harvests of salmon have ranged from 15.6 t to 42.4 t during 2000 to 2018, representing between 4,800 to 11,100 small salmon and 1,400 to 6,400 large salmon annually. The reported harvests in any year have been less than the maximum tags available for these fisheries. Reported harvest in 2018 was 33.1 t.
- Sampling of the fishery catches has taken place every year since 2006 by the members and officers of the Indigenous communities involved in the fisheries and the information and data shared with Fisheries and Oceans Canada.
- A new genetic baseline using single nucleotide polymorphisms (SNP) of salmon populations in eastern North America can accurately resolve the origin of salmon to twenty-one regional groups in eastern North America and 10 regional groups from Europe. Rivers in Labrador are associated to three groups, which are essentially structured by Salmon Fishing Areas (1A, 1B, 2, 14B) of Labrador.
- Finer scale genetic analyses of the regional contributions of Atlantic salmon to the sampled catches in the Labrador subsistence fisheries for 2017 and 2018 indicate that the large majority (> 99%) of the samples assigned to the three Labrador groups, with fisheries catches in each SFA assigning to their respective regional groups. Some USA origin salmon were identified from samples in 2017 (samples were from Salmon Fishing Area 2 and both fish were in the large salmon category), but not in 2018.

INTRODUCTION

In support of the North American Commission agenda item to address mixed stock fisheries in domestic waters of Commission member Parties, this document presents the following information:

- current management measures for the Labrador subsistence fisheries on Atlantic salmon
- summaries of annual harvests by location and size group of salmon
- summaries of the biological sampling program of this fishery,
- results from the determination of the origin of salmon sampled from these fisheries using genetic identification techniques

Fisheries for Atlantic salmon that occur at sea, along the coast, and in some cases in estuaries, have the potential to exploit salmon from multiple stock origins. The most important mixed-stock fisheries in Canada historically were the commercial fisheries which occurred in the marine coastal areas and in estuaries throughout eastern Canada. Since 2000, all commercial Atlantic salmon fisheries under Canadian jurisdiction have been closed and the sale of Canadian origin wild Atlantic salmon, regardless of fishery source, is prohibited.

Since the closure of the commercial fisheries for salmon in Canada, salmon are exploited by three user groups: Indigenous communities, Labrador resident food fisheries, and recreational fisheries. As reported to ICES and NASCO, the proportions of the Atlantic salmon harvests in Canada from all sources (Indigenous, recreational, Labrador resident food) which takes place in rivers (on single stocks), in estuaries, and in coastal areas have varied annually (Figure 1). Coastal harvests have ranged from about 2 t to 9 t during 2000 to 2018, representing about 8% (in 2018) or less of the total annual harvests of Atlantic salmon. Harvests in recreational fisheries occur exclusively in rivers. Harvests in Indigenous food, social and ceremonial fisheries of Quebec and the Maritime provinces occur in rivers and estuaries whereas harvests in the subsistence food fisheries (Indigenous and resident) of Labrador occur in estuaries and coastal areas.

The aboriginal fisheries that occur in estuaries of Quebec and the Maritime provinces take place in the vicinity of single rivers, generally in tidal waters of rivers, and consequently are not considered to be mixed-stock fisheries. While the net fisheries for the Labrador subsistence food fisheries are authorized for coastal waters, current fishing activity occurs with gillnets very close to the communities which are located in deep bays along the coast away from the headlands where interception of non-local stocks of salmon historically was an issue. Despite this important change in the location of the current Labrador subsistence fisheries compared to the locations of the historical commercial marine fisheries, the Labrador subsistence fisheries are considered by NASCO as mixed-stock fisheries and have been shown to intercept salmon from other regions of eastern North America.

GEOGRAPHIC LOCATION OF FISHERIES FOR ATLANTIC SALMON

The subsistence food fisheries in Labrador take place in estuaries and coastal areas. For the purposes of reporting the location of the harvests, the following definition of an estuary is used:

> "D.W. Pritchard (1967. What is an estuary: physical viewpoint. p. 3–5 in: G. H. Lauf (ed.) Estuaries, A.A.A.S. Publ. No. 83, Washington, D.C.) states that an estuary must (1) be partially enclosed, (2) have river(s) running into it, (3) have mix of fresh and sea water. An estuary is thus a partly enclosed coastal body of water in which river water is mixed with seawater, defined by salinity rather than geography. As

such Lake Melville in Labrador is considered to be an estuary" (D. Reddin DFO, unpubl. ICES working document).

Based on this definition and from interviews with guardian and fishery officers in Labrador, the fishing locations in Labrador were categorized as estuary or coastal and harvests attributed to these accordingly. Between 2000 and 2018, the percentage of the total Labrador subsistence harvests which were taken in coastal areas has ranged from 15.0% to 25.2% (Table 1). In 2018, 26.3 t (77%) of total subsistence fisheries harvests of Atlantic salmon were harvested from areas classified as estuaries and 6.8 t (21%) were from locations classified as coastal. Approximately similar percentages of the harvests in SFA 1A and SFA 2 occur in coastal areas (Table 2).

MANAGEMENT OF THE LABRADOR SUBSISTENCE FOOD FISHERIES

There are two types of subsistence net fisheries in Labrador that are authorized by Fisheries and Oceans Canada (DFO) to harvest Atlantic salmon:

- Resident subsistence Trout fishery that permits a by-catch of Atlantic salmon, and
- Indigenous Food Social and Ceremonial (FSC) Fisheries that direct for Atlantic salmon.

In previous years, the fishing season and mesh sizes in the various fisheries have been modified in an effort to reduce the capture of large salmon while at the same time providing an opportunity to harvest small salmon, trout and Arctic charr.

General management measures for these net fisheries:

- Carcass tags are required for all harvested Atlantic salmon
- Harvest allocations are limited by the number of tags provided to each group
- The number of fishers is limited to one designate or licence holder per household
- Monofilament netting materials are not permitted. Nylon twine only permitted
- Net must be set in a straight line
- Gear must be clearly marked with the full name of the fisher and other group specific information as required
- No fishing (nets must be removed from the water) for a 24 hour period between 6:00 p.m. Sunday and 6:00 p.m. Monday.
- Nets are not to be left unattended for a period of more than 24 hours
- Completed logbook of catch must be submitted to DFO at the end of season
- All sales of Atlantic salmon are prohibited

Resident Subsistence Trout Fishery

There is a long-standing tradition of trout net fishing in Labrador targeting Speckled trout (*Salvelinus fontinalis*) and Arctic charr (*Salvelinus alpinus*). Following the 1998 closure of the commercial salmon fishery in Labrador, there was an increased dependency on the trout fishery for subsistence purposes. A subsistence trout net licence is required and provided to residents of Labrador to harvest trout. A limit on the number of resident licences has only been set for Central Labrador (includes Lake Melville) at 152. There is a recognized bycatch of Atlantic salmon in trout nets and management measures are in place to minimize this harvest.

- 271 licences were issued in 2018:
    - Northern Labrador (SFA 1A) – 9
    - Central Labrador (includes Lake Melville) (SFA 1B) – 148
    - Southern Labrador (SFA 2) – 114

Additional management measures for this fishery:

- Seasonal limit of 50 trout/charr

- Maximum bycatch of three Atlantic salmon
- Fishing must cease when either the 3 salmon bycatch or 50 trout/charr limits are taken
- Licence holders are permitted to use a single net with a maximum length of 15 fathoms
- Mesh size permitted is not less than 102mm (4 inches)
- Mesh size greater than 127mm (5 inches) is not permitted in Northern Labrador
- Seasons in 2018 varied by location (Figure 1):
    - Northern Labrador (SFA 1A): 16 June to 15 July
    - Central Labrador (SFA 1B) (includes Lake Melville): 08 June to 01 July and 20 July to 12 August (Kenamu River closes 31 July)
    - Southern Labrador (SFA 2): 11 July to 29 July

Indigenous Food Social and Ceremonial (FSC) fisheries

In response to the Supreme Court of Canada decision interpreting Section 35 of the Constitution Act of 1982, DFO provided resource access to Indigenous groups of Labrador for FSC purposes. Between 1999 and 2005, a FSC fishery was made available for members of the Labrador Inuit Association (LIA) in northern Labrador (SFA 1A) as well as the Lake Melville area (SFA 1B) (Figure 1). In 2006, with the signing of the LIA Land Claims Agreement, a subsistence fishery with the Nunatsiavut Government (NG) which is the successor organization to the LIA was negotiated within Upper Lake Melville (ULM) and the Labrador Inuit Settlement Area (LISA). The Innu Nation also fishes for salmon in Lake Melville from the community of Sheshatshiu located in SFA 1B and northern Labrador from Natuashish located in SFA 1A (Figure 1). In 2004, members of the NunatuKavut Community Council (NCC) on the south coast of Labrador negotiated a subsistence fishery with DFO on the south coast in SFA 2 (Figure 1). The NCC further negotiated access to ULM since 2013.

In 2018, at total of 17,700 FSC tags were allocated and 2,252 unused tags were returned at the end of the season.

Indigenous groups with FSC fisheries in Labrador and specific measures for each FSC group are described below.

1. **Nunatsiavut Government (Upper Lake Melville and Labrador Inuit Settlement Area)**
    - 7,206 beneficiaries
    - 797 designated fishers
    - 8,700 tags were issued in 2018
    - <u>Upper Lake Melville (ULM)</u>
        - 4,000 tags were issued
        - The minimum mesh size is 3 inches and the maximum mesh size is 4 inches
        - The maximum length of net permitted per household is 25 fathoms
        - Fishing season extends from 15 June to 8 July and 19 July to 31 August
        - Fishing is allowed in tidal waters of the ULM outside of the LISA
    - <u>Labrador Inuit Settlement Area (LISA)</u>
        - 4,700 (4,200 plus 500 requested reserve; there is an annual reserve of 500 tags set aside for further allocation if requested)
        - There are various minimum mesh size requirements from 3 to 5 inches
        - The maximum length of net permitted per household is 25 fathoms
        - Fishing season extends from 15 June to 31 August
        - Fishing is allowed in tidal waters in various locations close to communities (Rigolet, Postville, Makkovik, Hopedale and Nain)

2. **Innu Nation (Sheshatshiu and Natuashish)**
   - 2,200 members
   - 87 designated fishers
   - 2,500 tags were issued in 2018
   - Sheshatshiu
     - 2,000 tags were issued
     - Minimum mesh size of 3 inches and maximum mesh size of 4 inches
     - The area of Lake Melville inside a line drawn from Point Epinette to Seal Point (The Kenamu Zone), the maximum length of net permitted per household is 25 fathoms. Fishers may have 2 nets where each net is a maximum of 12.5 fathoms.
     - Outside of the Kenamu Zone, designates are permitted to use up to a maximum of 37.5 fathoms of net which can be either 3 nets of 12.5 fathoms "OR" two nets comprised of one of 25 fathoms and one of 12.5 fathoms.
     - Fishing season extends from June 15 to September 15
     - Fishing is permitted from Fish Cove Point, north to Cape Harrison, including Lake Melville and the inland waters of Little Lake and Grand Lake in Upper Lake Melville
     - Fishing activity in tidal waters does not occur outside the waters of Upper Lake Melville in the Kenamu River-Sheshatshiu areas
   - Natuashish
     - 500 tags were issued
     - Minimum mesh size of 3.5 inches and maximum mesh size of 5 inches
     - The maximum length of net permitted per household is 25 fathoms. Fishers may have 2 nets where each net is a maximum of 12.5 fathoms.
     - Fishing season extends from 15 May to 31 August
     - Fishing is permitted in the tidal waters extending north and east from Cape Harrigan inclusive of Big Bay and south and east of Anaktalik Bay inclusive of Analtalik and Anktalik Bays including the inland waters of Sango Pond and Big Sango Lake

3. **NunatuKavut Community Council (Southern Labrador and Upper Lake Melville)**
   - 6,000 members
   - 1,166 designated fishers
   - 6,500 tags were issued in 2018e
   - Southern Labrador
     - 6,000 tags were issued
     - Minimum mesh size of 3.5 inches and maximum mesh size of 4 inches
     - The maximum length of net permitted per household is 25 fathom and designates may only have one net
     - Fishing season extends from 7 July to 15 August
     - Fishing takes place in tidal waters
   - Central Labrador - Upper Lake Melville
     - 500 tags were issued
     - The Upper Lake Melville fishing area is defined by the tidal waters inside and west of the boundary line that marks the Labrador Inuit Marine Zone in SFA 1B (Figure 1).
     - Minimum mesh size of 3.5 inches and maximum mesh size of 4 inches.
     - The maximum length of net permitted per household is 15 fathoms and designates may only have one net.

- Fishing season extends from 15 June to 8 July, and 19 July to 31 August

HARVESTS IN THE LABRADOR SUBSISTENCE FISHERIES

FSC and resident subsistence fishers use logbooks to record catch and effort information. Data from returned logbooks are compiled by each user group and submitted to Fisheries and Oceans Canada at the end of the season. Total harvests are estimated by adjusting the reported catches proportionately to the total licenced/designated fishers (Reddin et al. 2005). The combined logbook return rate was 73% in 2018 and ranged from 47% to 85% from 2001 to 2017 (average 70%).

Details of the harvests of Atlantic salmon by size group (small salmon, large salmon) in terms of weight (kg) and number of fish overall and by Salmon Fishing Area are provided in Table 3 for the years 2000 to 2018. Harvests of Atlantic salmon in the Labrador subsistence fisheries ranged from 15.6 t in 2000 to 42.4 t in 2015 (Table 3). With the exception of a few years (2013, 2015 to 2017), the small salmon size group comprises greater than 50% of the total harvest by weight, usually greater than 70% by number of salmon harvested, 67% small by number in 2018 (Table 3). In terms of number of salmon harvested, the subsistence food fisheries annually harvested 4,800 to 11,100 small salmon over the period 2000 to 2018 and large salmon harvests ranged from 1,400 to 6,400 fish, with the peak catches of small salmon in 2011 and large salmon in 2013 (Table 3).

Harvests are separated for the Labrador resident trout fishery (Table 4) and the aboriginal food, social and ceremonial (FSC) fisheries (Table 5).

The harvests of Atlantic salmon in the Labrador resident trout fisheries decreased after 2003 as some individuals fishing under the Labrador resident licence began fishing and reporting within the aboriginal communities. Since 2004, the harvests of Atlantic salmon in the resident trout fishery have varied between 1.4 t and 2.9 t, representing between 302 to 921 small salmon, 93 to 365 large salmon, in total (Table 4).

The reported harvests in the aboriginal FSC fisheries in Labrador over the period 2004 to 2018 have ranged from 24.7 t to 40.4 t, with large salmon representing between 34% and 67% of the total harvest of salmon by weight and 21% to 48% of the total by number (Table 5). These harvests (2004 to 2018) have represented between 6,600 and 10,600 small salmon, 2,600 to 6,000 large salmon by number.

Sampling Program: Labrador Subsistence Food Fishery

Salmon harvested in the Labrador subsistence fisheries (SFAs 1 and 2, Figure 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 2018, a total of 799 samples (6% of harvest by number) were collected from the Labrador subsistence fisheries: 131 from northern Labrador (SFA 1A), 308 from Lake Melville (SFA 1B), and 360 samples from southern Labrador (SFA 2) (Figure 1). Not all scales can be interpreted for sea age and/or river age. Based on the interpretation of the scale samples (n=788), percentage sea age composition was 81% 1SW, 15% 2SW, 3% 3SW and 1% previously spawned salmon. All of the salmon sampled (n=786) were river ages 3 to 6 years (modal age 4, 65%). There were no river age 1 or 2 salmon sampled, suggesting, as in previous years (2006 to 2017), that very few salmon from the most southern stocks of North America (USA, Scotia-Fundy) were exploited in these fisheries.

Labrador: Sample summary 2018								
Area	Number of Samples	River Age (percentage of samples)						
		1	2	3	4	5	6	7
Northern Labrador (SFA 1A)	288	0.0	0.0	22.9	69.1	7.3	0.7	0.0
Lake Melville (SFA 1B)	146	0.0	0.0	27.4	63.0	8.9	0.7	0.0
Southern Labrador (SFA 2)	352	0.0	0.0	12.5	62.5	23.9	1.1	0.0
All areas	786	0.0	0.0	19.1	65.0	15.0	0.9	0.0

The percentage of the small salmon and large salmon catch which was sampled and analysed for stock origin was approximately 3% to 4% by size group in 2017 and 2018, indicating that the size groups are equally represented in the analysed samples. The percentage of the catch which is processed for stock origin (3.8%) is less than the percentage of the catch sampled (6% by number) due to resource constraints.

LABRADOR SUBSISTENCE FISHERY SAMPLING			
Size group	Statistics	2017	2018
Small salmon	Samples	294	325
	Catch	6868	8373
	% of catch	4.3%	3.9%
Large salmon	Samples	189	153
	Catch	6192	4085
	% of catch	3.1%	3.7%
Small and large salmon	Samples	495	499
	Catch	13 060	12 458
	% of catch	3.8%	4.1%

For 2017 and 2018, a total of 994 samples from the Labrador subsistence salmon fisheries were analysed using the SNP panel with 31 range-wide regional reporting groups (Table 4; Figures 2 and 3). The estimated percent regional contributions (and associated 95% credible interval) are summarized in Figure 4 and Figure 5. As in previous years, the estimated origin of the samples was dominated (> 98%) by the Labrador groups. Although two samples of USA origin were detected in the 2017, none were detected in 2018. The dominance of the Labrador reporting group is consistent with previous analyses conducted for the period 2006–2016 which estimated > 95.0% of the harvest was attributable to Labrador stocks. Regional contributions within Labrador suggest largely local harvest within each of the salmon fishing areas, for example origin of salmon from the Lake Melville (SFA 1B) fishery are dominated by salmon from the Lake Melville regional group.

Table 1. Labrador subsistence fisheries harvests (weight in t; Indigenous and resident food) by geographic location of harvests, 2000 to 2018.

	Harvest (t)			Percentage of harvest	
Year	Estuarine	Coastal	Total	Estuarine	Coastal
2000	13.28	2.34	15.61	85.0	15.0
2001	13.50	2.79	16.29	82.9	17.1
2002	13.99	3.59	17.57	79.6	20.4
2003	17.49	4.62	22.11	79.1	20.9
2004	24.86	6.79	31.65	78.6	21.4
2005	24.72	7.20	31.91	77.5	22.5
2006	25.00	7.77	32.72	76.3	23.7
2007	20.45	6.01	26.46	77.3	22.7
2008	27.04	9.09	36.13	74.8	25.2
2009	22.61	7.20	29.81	75.9	24.1
2010	29.57	6.23	35.80	82.6	17.4
2011	33.84	7.52	41.36	81.8	18.2
2012	28.69	7.87	36.56	78.5	21.5
2013	31.66	8.31	39.97	79.2	20.8
2014	25.72	7.06	32.77	78.5	21.5
2015	34.27	8.16	42.44	80.8	19.2
2016	32.64	6.96	39.59	82.4	17.6
2017	30.34	9.04	39.37	77.0	23.0
2018	26.27	6.80	33.07	79.4	20.6

Table 2. The percentages of the harvested weight of Atlantic salmon in the Labrador subsistence fisheries that are taken in coastal areas, 2009 to 2018. All other harvests in these fisheries are taken in estuaries. Salmon fishing areas are shown in Figure 1.

Year	SFA 1A (northern Labrador)	SFA 1B (Lake Melville)	SFA 1 total	SFA 2 (Southern Labrador)	SFA 1 & 2 Labrador
2009	33.0%	0%	16.9%	33.0%	24.1%
2010	33.0%	0%	9.5%	33.0%	17.4%
2011	32.0%	0%	10.0%	33.0%	18.2%
2012	31.0%	0%	16.5%	32.1%	21.5%
2013	29.0%	0%	13.4%	34.1%	20.8%
2014	35.0%	0%	16.3%	32.0%	21.5%
2015	29.0%	0%	13.3%	30.0%	19.2%
2016	31.0%	0%	12.0%	31.0%	17.6%
2017	36.0%	0%	19.9%	30.0%	23.0%
2018	28.0%	0%	13.5%	32.0%	20.6%

Table 3. Labrador subsistence food fisheries harvests (weight in kg, and number of fish) by size group and overall, and by Salmon Fishing Area and overall, 2000 to 2018. Data for 2018 are provisional.

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
Labrador overall								
2000	10,353	5,261	15,614	5,323	1,352	6,675	33.7%	20.2%
2001	9,789	6,499	16,288	4,789	1,721	6,510	39.9%	26.4%
2002	11,581	5,990	17,572	5,806	1,389	7,195	34.1%	19.3%
2003	13,196	8,912	22,108	6,477	2,175	8,653	40.3%	25.1%
2004	17,379	14,270	31,649	8,385	3,696	12,081	45.1%	30.6%
2005	21,038	10,876	31,914	10,436	2,817	13,253	34.1%	21.3%
2006	21,198	11,523	32,721	10,377	3,090	13,467	35.2%	22.9%
2007	17,070	9,386	26,456	9,208	2,652	11,860	35.5%	22.4%
2008	19,386	16,975	36,361	9,834	3,909	13,743	46.7%	28.4%
2009	16,130	13,681	29,810	7,988	3,344	11,332	45.9%	29.5%
2010	20,523	15,070	35,593	9,867	3,725	13,595	42.3%	27.4%
2011	23,123	18,235	41,358	11,138	4,451	15,589	44.1%	28.6%
2012	18,738	17,820	36,559	9,977	4,228	14,204	48.7%	29.8%
2013	14,674	25,299	39,973	7,164	6,375	13,539	63.3%	47.1%
2014	17,916	14,858	32,774	8,959	3,995	12,953	45.3%	30.8%
2015	17,500	24,935	42,435	8,923	6,146	15,069	58.8%	40.8%
2016	14,579	25,022	39,601	7,645	5,595	13,240	63.2%	42.3%
2017	13,255	26,119	39,374	6,868	6,192	13,060	66.3%	47.4%
2018 (prov.)	16,697	16,375	33,072	8,373	4,085	12,458	49.5%	32.8%
SFA 1A (northern Labrador)								
2000	4,184	2,359	6,543	2,111	599	2,709	36.0%	22.1%
2001	4,446	3,449	7,895	2,178	890	3,068	43.7%	29.0%
2002	4,997	2,769	7,766	2,431	661	3,092	35.7%	21.4%
2003	6,672	5,051	11,723	3,217	1,169	4,386	43.1%	26.7%
2004	6,722	4,729	11,451	3,261	1,167	4,427	41.3%	26.4%
2005	5,044	3,517	8,561	2,468	859	3,327	41.1%	25.8%
2006	4,958	4,081	9,039	2,366	1,062	3,427	45.1%	31.0%
2007	3,263	2,460	5,723	1,874	751	2,624	43.0%	28.6%
2008	5,106	7,809	12,916	2,537	1,776	4,313	60.5%	41.2%
2009	4,045	4,355	8,400	1,880	1,038	2,917	51.8%	35.6%
2010	3,255	3,635	6,890	1,479	823	2,302	52.8%	35.7%
2011	4,012	4,329	8,340	1,825	983	2,809	51.9%	35.0%
2012	5,096	8,097	13,193	2,849	1,752	4,601	61.4%	38.1%
2013	2,635	9,251	11,887	1,278	2,278	3,556	77.8%	64.1%
2014	3,918	6,316	10,234	1,907	1,713	3,621	61.7%	47.3%
2015	4,001	8,544	12,545	2,017	2,093	4,110	68.1%	50.9%
2016	2,701	8,140	10,841	1,392	1,834	3,226	75.1%	56.9%
2017	3,648	11,615	15,263	1,875	2,724	4,599	76.1%	59.2%
2018 (prov.)	3,336	6,514	9,850	1,707	1,551	3,258	66.1%	47.6%
SFA 1B (Lake Melville)								
2000	3,927	2,006	5,933	2,001	493	2,493	33.8%	19.8%
2001	2,550	1,672	4,222	1,215	409	1,624	39.6%	25.2%
2002	2,389	1,672	4,061	1,178	354	1,532	41.2%	23.1%
2003	2,422	1,975	4,397	1,165	470	1,635	44.9%	28.7%
2004	3,316	3,927	7,243	1,561	1,043	2,604	54.2%	40.1%
2005	5,072	3,414	8,485	2,490	828	3,318	40.2%	24.9%
2006	6,231	2,249	8,480	3,057	577	3,634	26.5%	15.9%
2007	5,043	2,854	7,896	2,827	809	3,636	36.1%	22.3%
2008	5,235	5,818	11,053	2,616	1,179	3,795	52.6%	31.1%
2009	4,128	3,877	8,005	2,084	870	2,954	48.4%	29.4%

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
2010	9,414	7,506	16,920	4,478	1,847	6,324	44.4%	29.2%
2011	9,826	8,498	18,323	4,648	1,967	6,615	46.4%	29.7%
2012	5,532	6,025	11,557	2,891	1,410	4,301	52.1%	32.8%
2013	5,119	8,684	13,803	2,476	2,084	4,560	62.9%	45.7%
2014	6,863	4,822	11,685	3,390	1,251	4,642	41.3%	27.0%
2015	5,512	9,299	14,811	2,803	2,067	4,870	62.8%	42.4%
2016	5,190	11,954	17,144	2,722	2,409	5,131	69.7%	46.9%
2017	3,356	8,946	12,302	1,693	1,995	3,688	72.7%	54.1%
2018 (prov.)	4,905	5,681	10,586	2,100	1,370	3,470	53.7%	39.5%
SFA 2 (southern Labrador)								
2000	2,242	897	3,139	1,212	260	1,472	28.6%	17.7%
2001	2,793	1,378	4,172	1,396	422	1,818	33.0%	23.2%
2002	4,196	1,549	5,745	2,197	374	2,571	27.0%	14.6%
2003	4,102	1,885	5,987	2,095	536	2,632	31.5%	20.4%
2004	7,341	5,614	12,955	3,564	1,486	5,050	43.3%	29.4%
2005	10,922	3,946	14,868	5,479	1,130	6,609	26.5%	17.1%
2006	10,008	5,193	15,201	4,955	1,451	6,406	34.2%	22.7%
2007	8,764	4,073	12,837	4,507	1,092	5,599	31.7%	19.5%
2008	9,044	3,349	12,393	4,680	954	5,634	27.0%	16.9%
2009	7,956	5,449	13,405	4,024	1,437	5,461	40.6%	26.3%
2010	8,033	3,952	11,985	4,041	1,069	5,110	33.0%	20.9%
2011	9,285	5,409	14,694	4,665	1,501	6,165	36.8%	24.3%
2012	8,110	3,699	11,809	4,237	1,066	5,303	31.3%	20.1%
2013	6,920	7,364	14,284	3,410	2,012	5,422	51.6%	37.1%
2014	7,135	3,720	10,855	3,661	1,030	4,691	34.3%	22.0%
2015	7,988	7,093	15,081	4,103	1,987	6,030	47.0%	33.0%
2016	6,688	4,930	11,618	3,531	1,352	4,883	42.4%	27.7%
2017	6,251	5,558	11,809	3,300	1,473	4,773	47.1%	30.9%
2018 (prov.)	8,456	4,180	12,636	4,566	1,164	5,730	33.1%	20.3%

Table 4. Labrador resident trout fisheries harvests (weight in kg, and number of fish) of Atlantic salmon by size group and overall, and by Salmon Fishing Area and overall, 2000 to 2017. Data for 2017 are provisional.

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
Labrador overall								
2000	2,480	1,057	3,537	1,330	298	1,628	29.9%	18.3%
2001	3,082	1,501	4,583	1,530	449	1,979	32.8%	22.7%
2002	4,504	1,642	6,146	2,349	399	2,747	26.7%	14.5%
2003	4,502	2,157	6,659	2,294	608	2,902	32.4%	20.9%
2004	1,302	869	2,171	652	224	876	40.0%	25.6%
2005	1,817	871	2,688	921	228	1,150	32.4%	19.9%
2006	1,574	1,007	2,581	769	283	1,052	39.0%	26.9%
2007	1,294	388	1,682	640	93	734	23.1%	12.7%
2008	1,253	1,064	2,317	619	210	830	45.9%	25.3%
2009	1,644	1,212	2,856	806	313	1,119	42.4%	28.0%
2010	1,408	861	2,269	731	255	990	37.9%	25.7%
2011	1,027	1,059	2,085	501	290	791	50.8%	36.6%
2012	873	827	1,700	435	206	641	48.7%	32.2%
2013	714	1,342	2,057	345	365	710	65.3%	51.4%
2014	886	746	1,632	454	204	659	45.7%	31.0%
2015	932	1,084	2,016	471	293	764	53.8%	38.4%
2016	712	911	1,623	368	228	596	56.1%	38.3%
2017	592	831	1,423	302	197	499	58.4%	39.5%
2018 (prov.)	831	627	1,458	438	154	592	43.0%	26.0%
SFA 1A (northern Labrador)								
2000	0	0	0	0	0	0	na	na
2001	0	0	0	0	0	0	na	na
2002	0	0	0	0	0	0	na	na
2003	0	0	0	0	0	0	na	na
2004	13	9	22	6	2	8	39.2%	25.0%
2005	13	9	22	6	2	8	39.2%	25.0%
2006	13	9	22	6	2	8	39.2%	25.0%
2007	0	0	0	0	0	0	na	na
2008	20	247	267	4	24	28	92.5%	85.7%
2009	0	0	0	0	0	0	na	na
2010	14	6	20	7	1	8	30.0%	13.0%
2011	7	16	23	3	5	8	69.6%	62.5%
2012	18	70	88	9	15	24	79.5%	62.5%
2013	0	0	0	0	0	0	na	na
2014	11	17	29	6	4	10	59.8%	42.9%
2015	14	59	73	8	12	20	59.8%	42.9%
2016	26	48	74	17	11	28	59.8%	42.9%
2017	0	104	104	0	15	15	59.8%	42.9%
2018 (prov.)	3	50	53	2	9	11	59.8%	42.9%
SFA 1B (Lake Melville)								
2000	238	160	398	118	38	156	40.2%	24.4%
2001	288	123	411	135	27	161	29.9%	16.5%
2002	309	93	402	152	24	176	23.1%	13.9%
2003	400	272	672	199	71	270	40.5%	26.4%
2004	439	502	942	210	122	332	53.3%	36.7%
2005	711	607	1,318	336	154	490	46.0%	31.4%
2006	223	76	298	111	21	132	25.3%	16.0%
2007	397	57	454	186	15	201	12.6%	7.7%
2008	171	122	293	88	29	117	41.7%	24.8%
2009	243	213	456	122	56	178	46.7%	31.5%

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
2010	602	461	1,062	292	144	436	43.4%	33.0%
2011	401	656	1,057	190	170	360	62.1%	47.1%
2012	362	526	888	177	131	308	59.2%	42.5%
2013	322	789	1111	153	213	366	71.0%	58.3%
2014	381	425	806	183	110	293	52.7%	37.6%
2015	349	621	970	171	159	330	64.0%	48.2%
2016	245	570	815	123	135	258	69.9%	52.3%
2017	275	497	772	134	120	254	64.4%	47.2%
2018 (prov.)	340	422	762	172	100	272	55.4%	36.8%
SFA 2 (southern Labrador)								
2000	2,242	897	3,139	1,212	260	1,472	28.6%	17.7%
2001	2,793	1,378	4,172	1,396	422	1,818	33.0%	23.2%
2002	4,196	1,549	5,745	2,197	374	2,571	27.0%	14.6%
2003	4,102	1,885	5,987	2,095	536	2,632	31.5%	20.4%
2004	849	358	1,207	436	100	536	29.6%	18.7%
2005	1,092	255	1,347	579	72	652	18.9%	11.1%
2006	1,338	922	2,260	652	260	912	40.8%	28.5%
2007	897	331	1,228	455	78	533	26.9%	14.6%
2008	1,062	695	1,757	528	157	685	39.6%	22.9%
2009	1,401	998	2,400	684	257	941	41.6%	27.3%
2010	808	376	1,184	441	105	546	31.8%	19.3%
2011	619	387	1,005	308	115	423	38.5%	27.3%
2012	493	232	725	249	60	309	32.0%	19.4%
2013	392	554	946	193	152	344	58.5%	44.0%
2014	493	304	797	265	90	355	38.2%	25.2%
2015	569	405	974	292	123	355	41.6%	34.6%
2016	441	294	735	228	83	311	40.0%	26.7%
2017	317	230	547	168	62	230	42.0%	27.0%
2018 (prov.)	488	155	643	264	45	309	24.1%	14.6%

Table 5. Labrador Indigenous food, social, and ceremonial fisheries harvests (weight in kg, and number of fish) for Atlantic salmon by size group and overall, and by Salmon Fishing Area and overall, 2000 to 2018. Data for 2018 are provisional.

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
Labrador overall								
2000	7,873	4,205	12,077	3,993	1,054	5,047	34.8%	20.9%
2001	6,707	4,998	11,705	3,259	1,272	4,531	42.7%	28.1%
2002	7,077	4,348	11,425	3,457	990	4,448	38.1%	22.3%
2003	8,695	6,754	15,449	4,183	1,568	5,751	43.7%	27.3%
2004	16,077	13,401	29,478	7,733	3,472	11,205	45.5%	31.0%
2005	19,221	10,005	29,226	9,515	2,588	12,103	34.2%	21.4%
2006	19,623	10,516	30,140	9,608	2,807	12,415	34.9%	22.6%
2007	15,775	8,999	24,774	8,567	2,559	11,126	36.3%	23.0%
2008	18,133	15,911	34,044	9,215	3,699	12,913	46.7%	28.6%
2009	14,485	12,469	26,955	7,182	3,031	10,213	46.3%	29.7%
2010	19,115	14,209	33,324	9,135	3,470	12,605	42.6%	27.5%
2011	22,096	17,176	39,272	10,637	4,161	14,798	43.7%	28.1%
2012	17,865	16,993	34,858	9,542	4,022	13,564	48.7%	29.7%
2013	13,959	23,957	37,916	6,819	6,010	12,828	63.2%	46.8%
2014	17,031	14,112	31,142	8,504	3,790	12,295	45.3%	30.8%
2015	16,569	23,851	40,419	8,452	5,853	14,305	59.0%	40.9%
2016	13,867	24,111	37,978	7,277	5,366	12,644	63.5%	42.4%
2017	12,663	25,288	37,951	6,566	5,995	12,561	66.6%	47.7%
2018 (prov.)	15,866	15,748	31,614	7,935	3,931	11,866	49.8%	33.1%
SFA 1A (northern Labrador)								
2000	4,184	2,359	6,543	2,111	599	2,709	36.0%	22.1%
2001	4,446	3,449	7,895	2,178	890	3,068	43.7%	29.0%
2002	4,997	2,769	7,766	2,431	661	3,092	35.7%	21.4%
2003	6,672	5,051	11,723	3,217	1,169	4,386	43.1%	26.7%
2004	6,709	4,720	11,429	3,255	1,165	4,419	41.3%	26.4%
2005	5,031	3,508	8,539	2,462	857	3,319	41.1%	25.8%
2006	4,945	4,072	9,017	2,360	1,060	3,419	45.2%	31.0%
2007	3,263	2,460	5,723	1,874	751	2,624	43.0%	28.6%
2008	5,086	7,562	12,649	2,533	1,752	4,285	59.8%	40.9%
2009	4,045	4,355	8,400	1,880	1,038	2,917	51.8%	35.6%
2010	3,241	3,629	6,870	1,472	822	2,294	52.8%	35.8%
2011	4,005	4,313	8,317	1,822	978	2,801	51.9%	34.9%
2012	5,078	8,027	13,105	2,840	1,737	4,577	61.3%	38.0%
2013	2,635	9,251	11,887	1,278	2,278	3,556	77.8%	64.1%
2014	3,906	6,299	10,205	1,901	1,709	3,611	61.8%	47.4%
2015	3,987	8,485	12,472	2,009	2,081	4,090	68.0%	50.9%
2016	2,675	8,092	10,767	1,375	1,823	3,198	75.2%	57.0%
2017	3,648	11,511	15,159	1,875	2,709	4,584	75.9%	59.1%
2018 (prov.)	3,333	6,464	9,797	1,705	1,542	3,247	66.0%	47.5%
SFA 1B (Lake Melville)								
2000	3,689	1,846	5,535	1,883	455	2,337	33.4%	19.5%
2001	2,261	1,549	3,810	1,081	382	1,463	40.7%	26.1%
2002	2,080	1,579	3,659	1,027	329	1,356	43.2%	24.3%
2003	2,023	1,703	3,725	966	399	1,365	45.7%	29.2%
2004	2,876	3,424	6,301	1,351	922	2,272	54.4%	40.6%
2005	4,361	2,807	7,167	2,154	674	2,828	39.2%	23.8%
2006	6,008	2,174	8,182	2,946	556	3,502	26.6%	15.9%
2007	4,646	2,796	7,442	2,641	794	3,435	37.6%	23.1%
2008	5,064	5,695	10,760	2,529	1,150	3,679	52.9%	31.3%

	Weight (kg)			Number of fish			% Large	
Year	Small	Large	Total	Small	Large	Total	By weight	By number
2009	3,885	3,663	7,549	1,962	814	2,776	48.5%	29.3%
2010	8,812	7,046	15,858	4,186	1,703	5,888	44.4%	28.9%
2011	9,425	7,841	17,266	4,457	1,798	6,255	45.4%	28.7%
2012	5,170	5,499	10,669	2,714	1,279	3,993	51.5%	32.0%
2013	4,796	7,895	12,691	2,323	1,871	4,194	62.2%	44.6%
2014	6,482	4,397	10,879	3,207	1,141	4,348	40.4%	26.2%
2015	5,163	8,678	13,841	2,632	1,908	4,540	62.7%	42.0%
2016	4,945	11,384	16,329	2,599	2,274	4,873	69.7%	46.7%
2017	3,081	8,449	11,530	1,559	1,875	3,434	73.3%	54.6%
2018 (prov.)	4,565	5,259	9,824	1,928	1,270	3,198	53.5%	39.7%
SFA 2 (southern Labrador)								
2000	0	0	0	0	0	0	na	na
2001	0	0	0	0	0	0	na	na
2002	0	0	0	0	0	0	na	na
2003	0	0	0	0	0	0	na	na
2004	6,492	5,256	11,748	3,128	1,386	4,514	44.7%	30.7%
2005	9,830	3,691	13,520	4,899	1,058	5,957	27.3%	17.8%
2006	8,670	4,270	12,941	4,303	1,191	5,494	33.0%	21.7%
2007	7,867	3,742	11,609	4,052	1,014	5,066	32.2%	20.0%
2008	7,982	2,654	10,636	4,153	797	4,949	24.9%	16.1%
2009	6,555	4,451	11,006	3,340	1,180	4,520	40.4%	26.1%
2010	7,225	3,576	10,801	3,600	964	4,564	33.1%	21.1%
2011	8,667	5,022	13,689	4,357	1,385	5,742	36.7%	24.1%
2012	7,617	3,467	11,084	3,988	1,006	4,994	31.3%	20.1%
2013	6,528	6,810	13,338	3,217	1,860	5,078	51.1%	36.6%
2014	6,642	3,415	10,058	3,396	940	4,336	34.0%	21.7%
2015	7419	6688	14,107	3811	1864	5,675	47.4%	32.8%
2016	6247	4636	10,883	3303	1269	4,572	42.6%	27.8%
2017	5934	5328	11,262	3132	1411	4,543	47.3%	31.1%
2018 (prov.)	7968	4025	11,993	4302	1119	5,421	33.6%	20.6%

Table 6. Regional groups and acronyms defined from the range wide single nucleotide polymorphism (SNP) genetic baseline for Atlantic salmon in the North Atlantic.

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

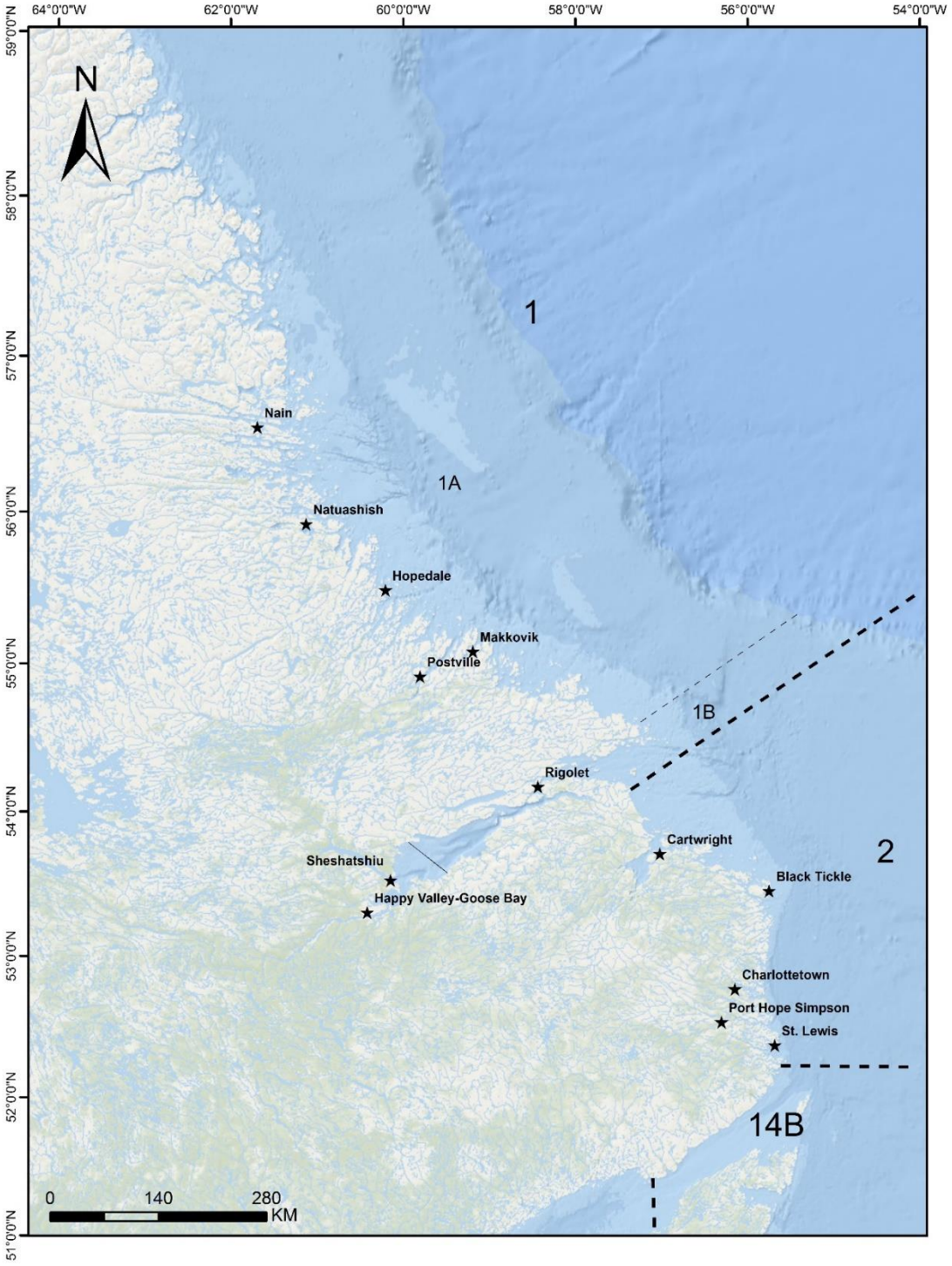

Figure 1. Map of Salmon Fishing Areas (SFAs) and local communities in Labrador. Line across Lake Melville marks the division between Upper Lake Melville and the Labrador Inuit Settlement Area.

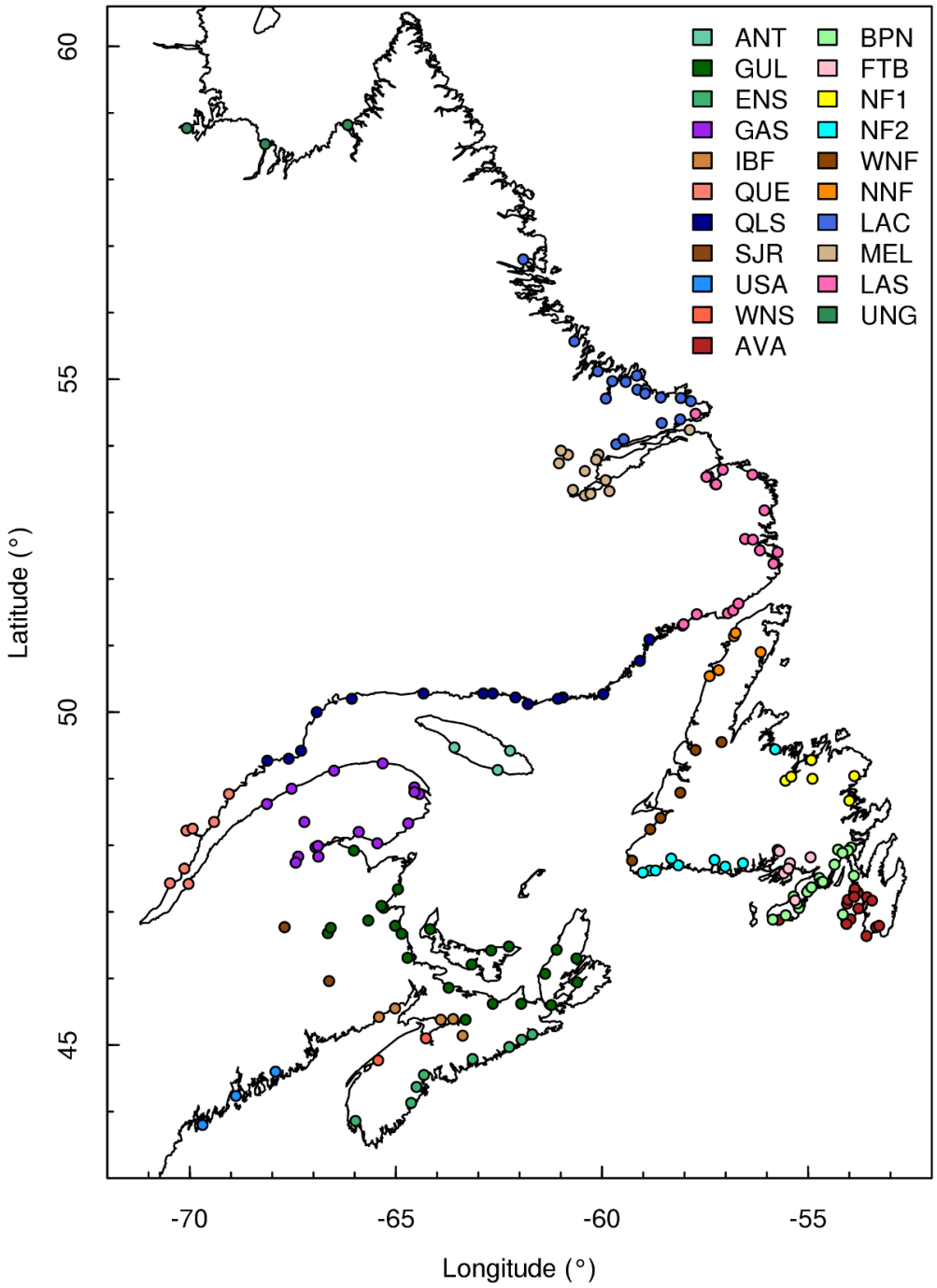

Figure 2. Map of North American sample locations used in the SNP baseline for Atlantic salmon. The 21 North American regional groups are labelled and identified by colour. See Figure 3 for full range wide baseline sampling locations.

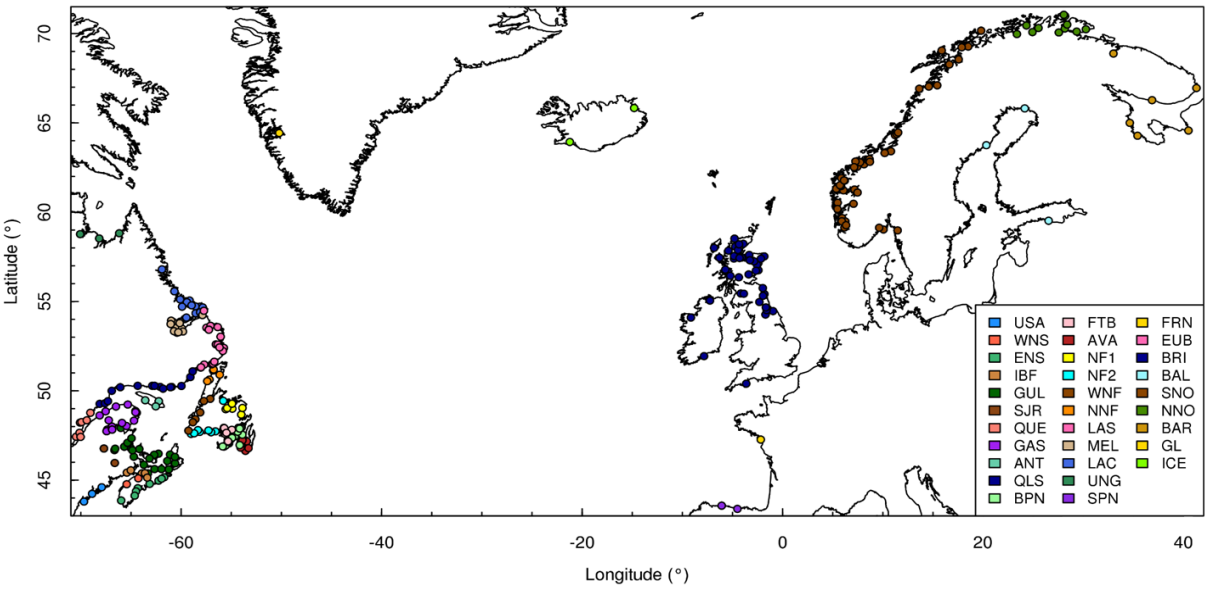

Figure 3. Map of range wide sample locations used in the SNP baseline for Atlantic salmon and the 31 defined regional groups (labelled and identified by colour). See Figure 2 for finer resolution of North American locations.

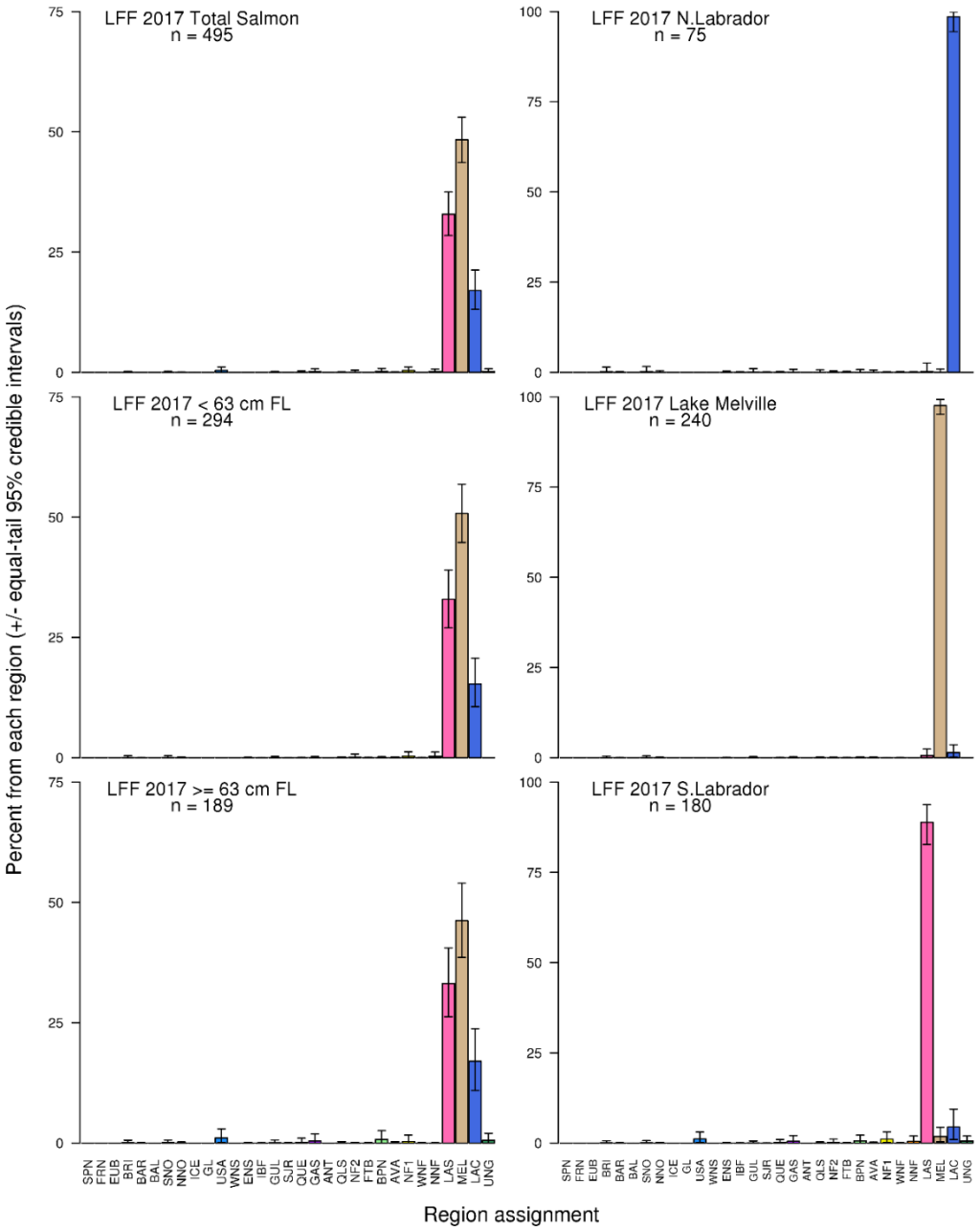

Figure 4. Bayesian estimate of mixture composition of samples from the Labrador Atlantic salmon fisheries for 2017 by size group (small <63 cm, large ≥63 cm) and region (Figure 1: SFA 1A – N. Labrador, SFA 1B – Lake Melville, and SFA 2 –S. Labrador). Baseline locations refer to regional reporting groups identified in Figure 2 and 3. Regional assignment acronyms explained in Table 6. Note that credible intervals with a lower bound including zero indicate little support for the mean assignment value.

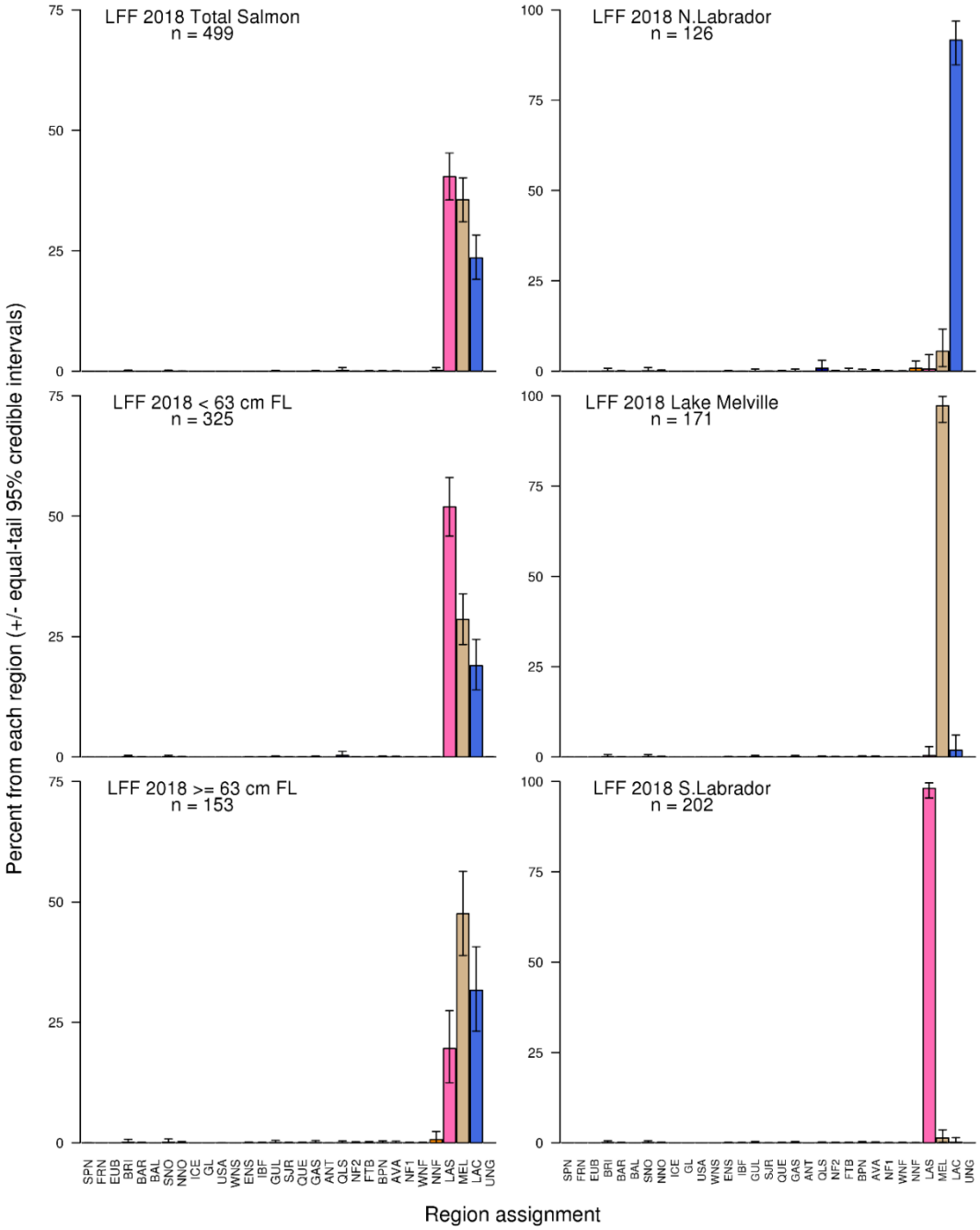

Figure 5. Bayesian estimate of mixture composition of samples from the Labrador Atlantic salmon fisheries for 2018 by size group (small <63 cm, large ≥63 cm) and region (Figure 1: SFA 1A – N. Labrador, SFA 1B – Lake Melville, and SFA 2 – S. Labrador). Baseline locations refer to regional reporting groups identified in Figure 2 and Figure 3. Regional assignment acronyms explained in Table 6.