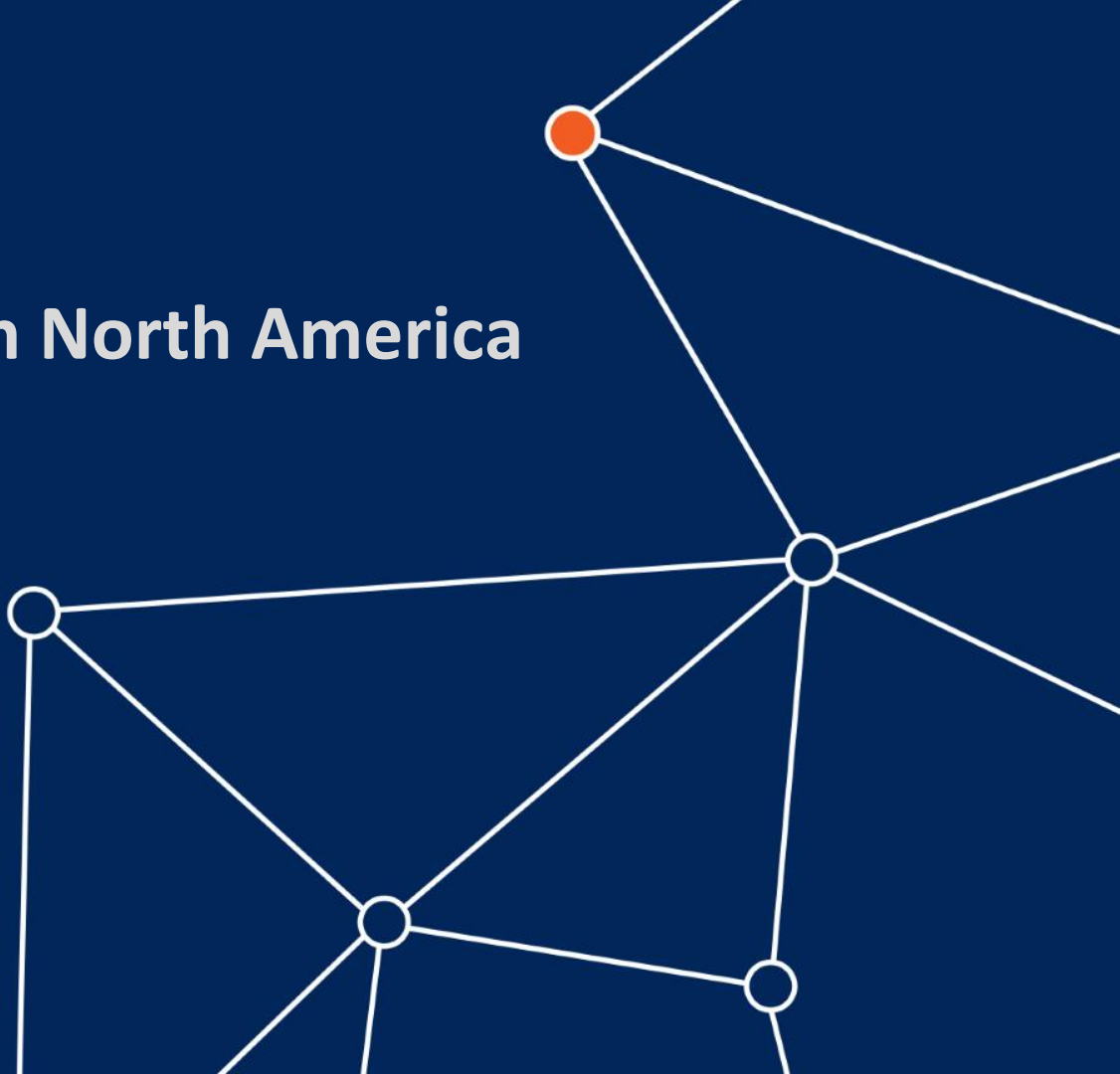
North American Commission

NAC(18)09

Presentation of the ICES Advice for the North American stocks to the Commission

sal.21.nac

Atlantic salmon from North America



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Terms of Reference

3. With respect to Atlantic salmon in the North American Commission area:

3.1 describe the key events of the 2017 fisheries (including the fishery at St Pierre and Miquelon);

3.2 update age-specific stock conservation limits based on new information as available, including updating the time-series of the number of river stocks with established CLs by jurisdiction;

3.3 describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction;

3.4 provide catch options or alternative management advice for 2018-2021 with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding; and

3.5 update the Framework of Indicators used to identify any significant change in the previously provided multi-annual management advice.

3.1 Key Events 2017 Fisheries: Catch

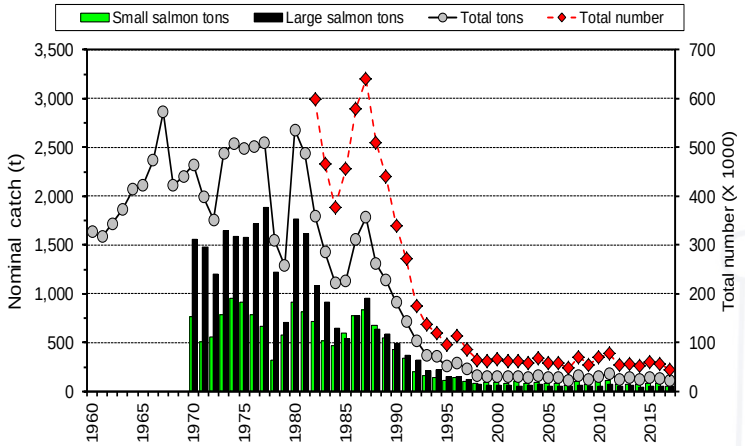
	Reported	Unreported
• Canada:	112 t (8% coastal)	25 t
• Saint Pierre and Miquelon (France):	3 t (100% coastal)	-
• USA:	0 t	0 t

Sal.21.nac: Table 1

	Canada					St Pierre & Miquelon (SPM)	USA	North America
	Commercial	Indigenous (FSC)	Labrador Resident	Recreational	Total			
2017 reported harvests (t)	0	61	2	49	112	3	0	115
% of NAC total	-	53	1	43	98	2	0	100
Unreported catch (t)					25	na	0	25
Location of catches								
% in-river					62	0	-	61
% in estuaries					30	0	-	29
% coastal					8	100	-	10

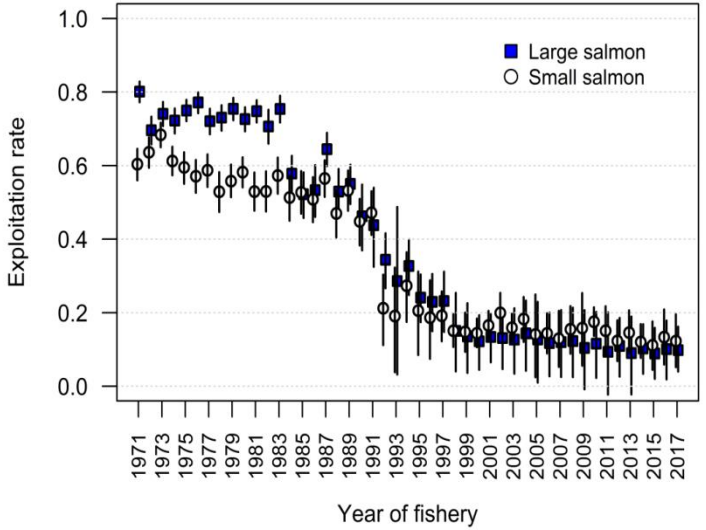
3.1 Key Events 2017 Fisheries: Canada

- Total Catch (harvest; t) Canada 1960-2017 (sal.21.nac: Figure 1)
  - 112 t: 32 439 small (55 t) and 11 578 large (57 t)



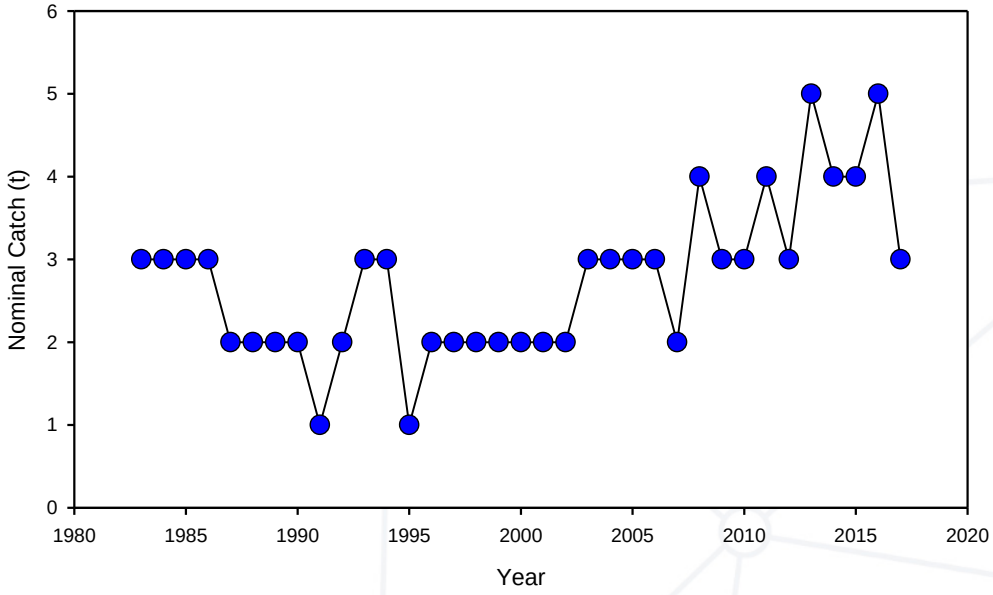
- Recreational Fisheries (49 t, 43% Total Catch)
  - Recreational Harvest: 24 987 salmon
  - Catch and Release: 49 513 salmon (67% Recreational Catch)

- Exploitation Rates 1971-2017 (sal.21.nac: Figure 3)
  - currently lowest in time period



3.1 Key Events 2017 Fisheries: Saint Pierre & Miquelon (SPM)

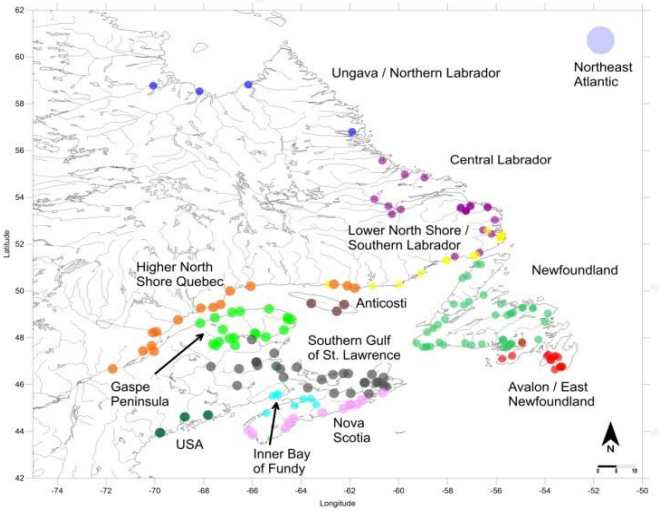
- Saint Pierre and Miquelon catches increased over time
- 2017 reported catch of 3 t less than previous 5 year mean of 4.2 t (2012-2016)

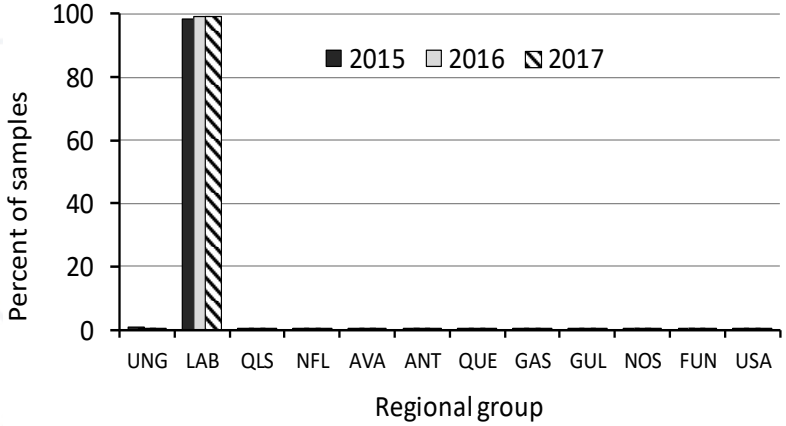


3.1 Key Events 2017 Fisheries:
Origin and Composition of Catches

Labrador Subsistence Fisheries (sal.21.nac: Figure 5)

- 2015 to 2017: 1486 samples (3% to 5% of harvest)
- 98.9% Labrador origin (LAB)
- 2017: 2 of 180 samples assigned to the USA (estimated harvest of 41 salmon)
- No USA salmon 2012 to 2016 analyses
- 4 USA were reported between 2006 to 2011



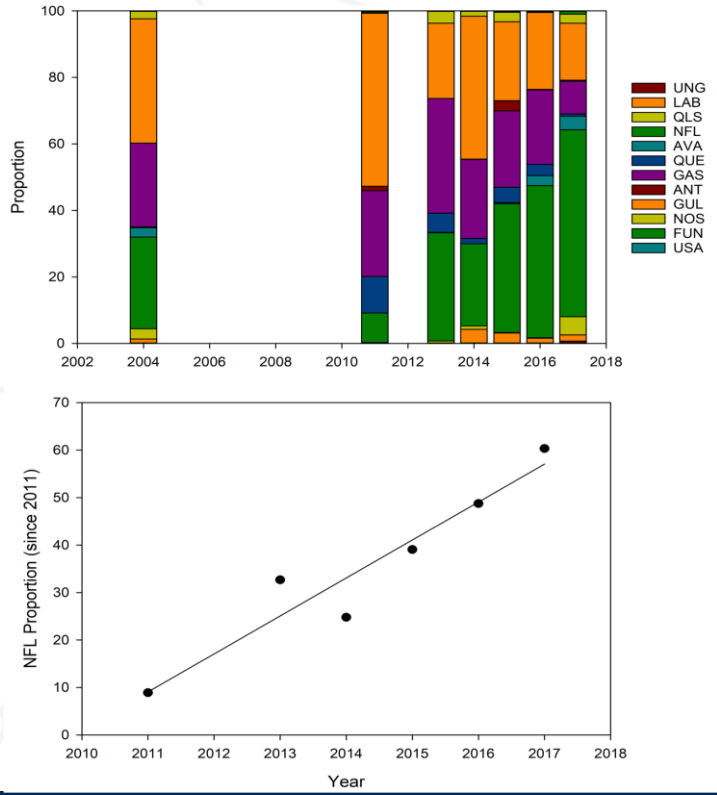


3.1 Key Events 2017 Fisheries:
Origin and Composition of Catches

Saint Pierre and Miquelon Fishery (sal.21.nac: Figure 6)

- 2015 to 2017: 398 samples
- Samples dominated by small salmon (< 63 cm)
- 83-89% assigned to 3 reporting regions
  - Southern Gulf of St. Lawrence (GUL)
  - Gaspe Peninsula (GAS)
  - Newfoundland (NFL)
- 2013 and 2014 dominated by large salmon
- Increase in small salmon samples in most recent years corresponds to an increase in Newfoundland assignment

- No information on size of salmon (e.g. proportion small and large) in the total harvest to determine if tissue samples representative of the catch



3.2 Stock Conservation Limits (CLs)

- sal.21.nac: Table 3, Figure 7

Number of Rivers

Canada

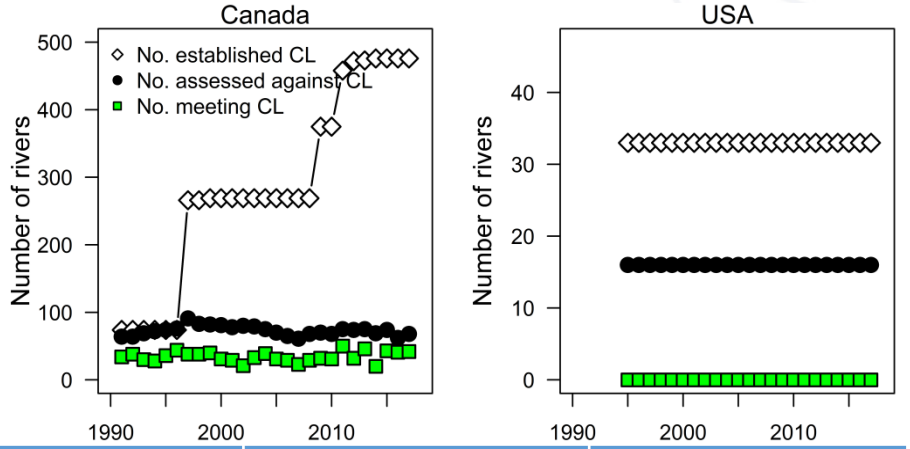
1991 – 74

1997 – 266

2014-2017 – 476

USA

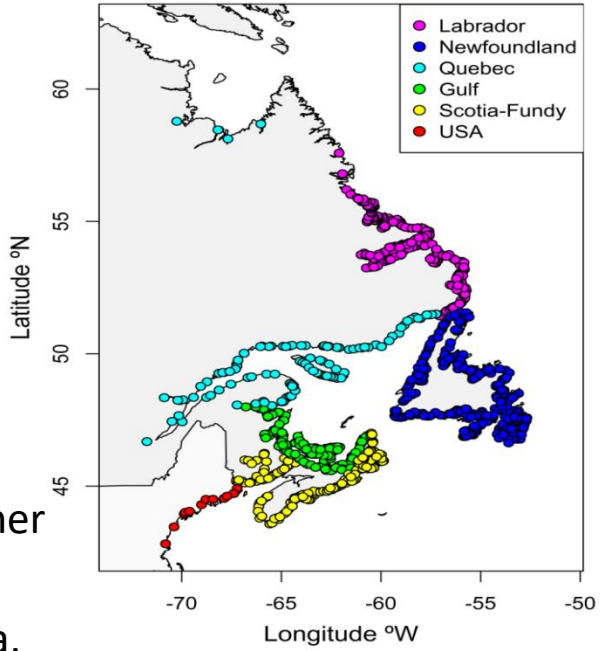
Since 1995 – 33



Country and Commission Area	Assessment regional group	2SW conservation limit (number of fish)	Management objective (number of fish)
Canada	Labrador	34 746	
	Newfoundland	4 022	
	Gulf of St. Lawrence	30 430	
	Quebec	29 446	
	Scotia-Fundy	24 705	**10 976**
	Total	123 349	
USA		29 199	**4 549**
North American Commission		**152 548**	

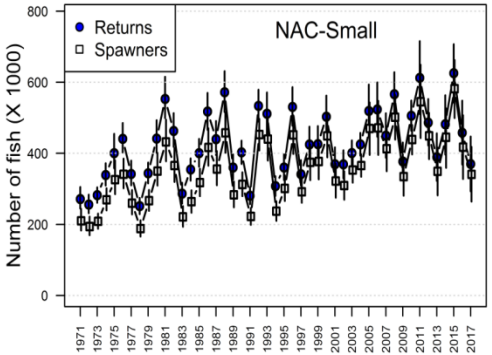
3.3 Status of Stocks

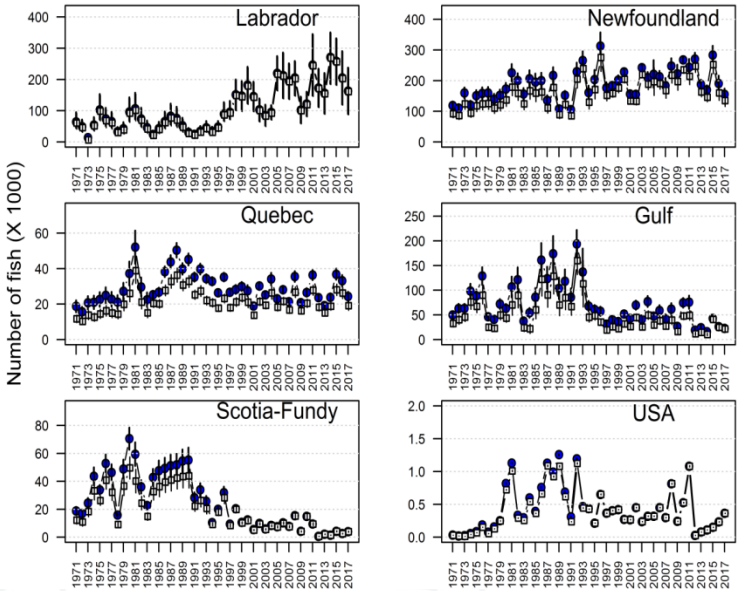
- Six regions and overall for North America (sal.21.nac: Figure 2)
- Size groups:
  - small (1SW)
  - large (MSW and repeat spawners)
  - 2SW salmon (a subset of large)
- Returns: include fish caught by homewater commercial fisheries, except Newfoundland and Labrador
- Pre-fishery abundance (PFA; recruitment):
  - Non-maturing 1SW salmon on August 1st of the second summer at sea (i.e. destined 2SW returns)
  - Accounts for returns to rivers, fisheries at sea in North America, fisheries at West Greenland, and natural mortality



3.3 Status of Stocks: Small Returns

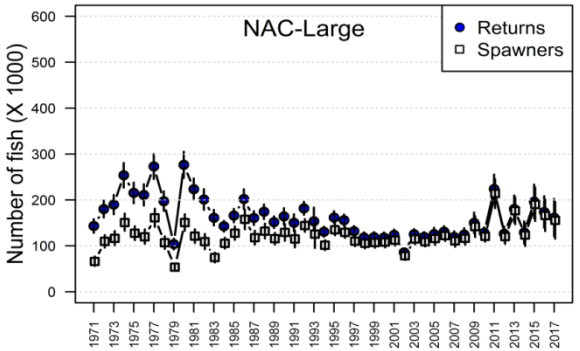
- Small salmon returns to North America in 2017 (sal.21.nac: Figure 8)
  - 370 000 small salmon
  - 19% lower than 2016
  - lower range of the 48 year time series
  - four of the six geographical regions declined from 2016
  - Labrador and Newfoundland combined represent 86% of the 2017 total small salmon returns to North America

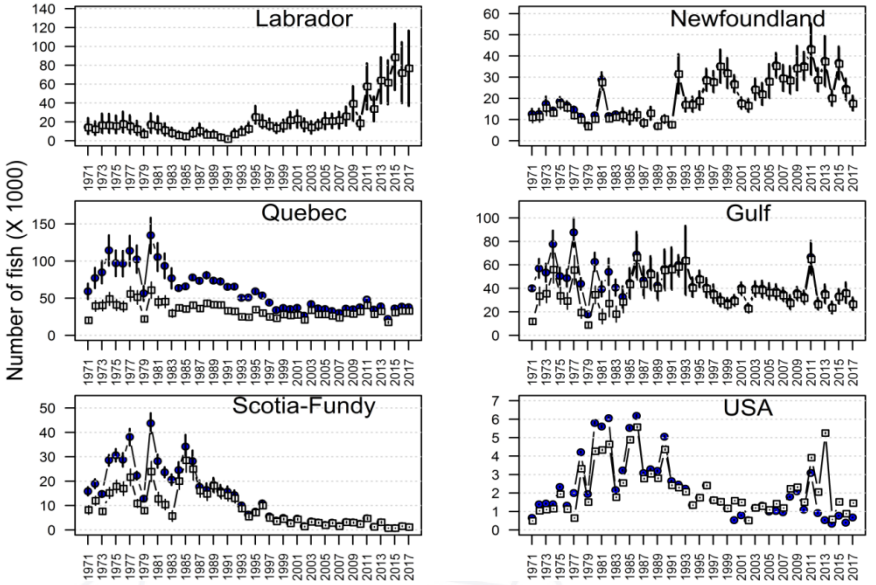




3.3 Status of Stocks: Large Returns

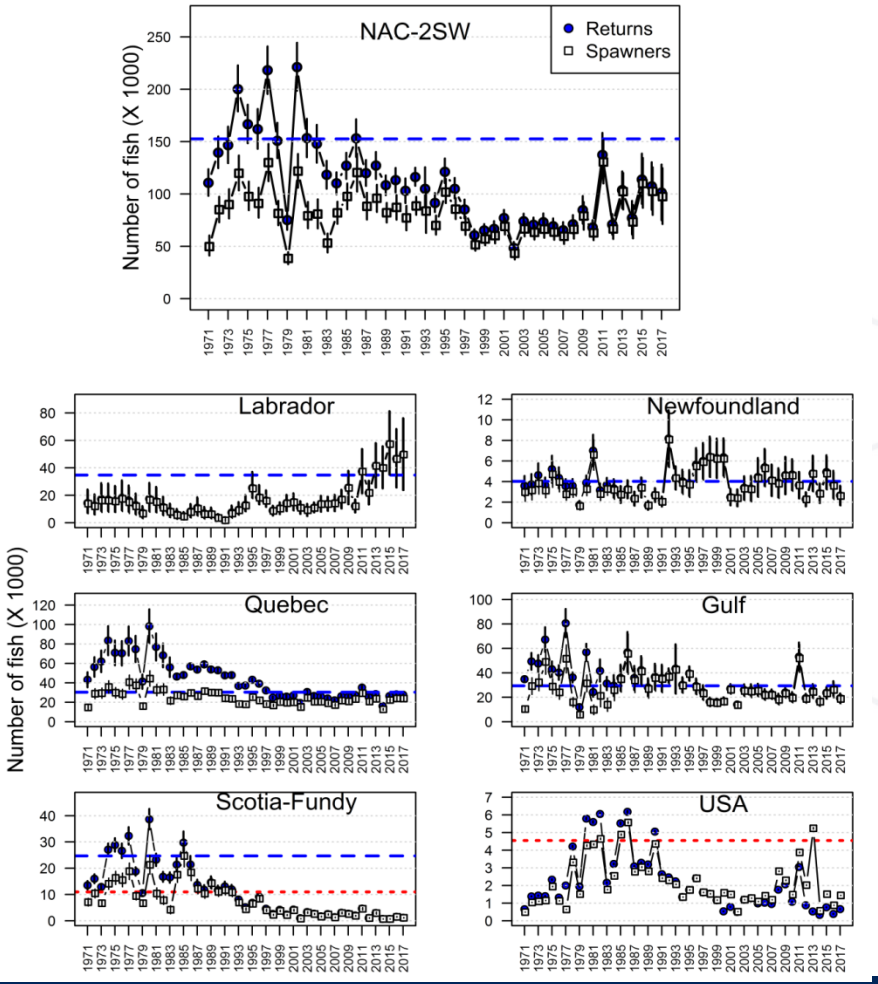
- Large salmon returns to North America in 2017 (sal.21.nac: Figure 9)
  - 161 500 large salmon
  - 7% lower than 2016
  - mid-range of the 48 year time series
  - four of the six geographical regions declined from 2016
  - Labrador, Québec and Gulf combined represent 88% of the 2017 total large salmon returns to North America





3.3 Status of Stocks: 2SW Returns

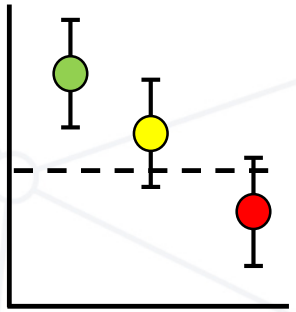
- 2SW salmon returns to North America in 2017 (sal.21.nac: Figure 10)
  - 101 350 2SW salmon
  - 6% lower than 2016
  - four of the six geographical regions declined from 2016
  - among lowest on record with the exception of Labrador
  - Labrador, Québec and Gulf combined represent 96% of the 2017 total 2SW salmon returns to North America



3.3 Status of Stocks: Reference Points

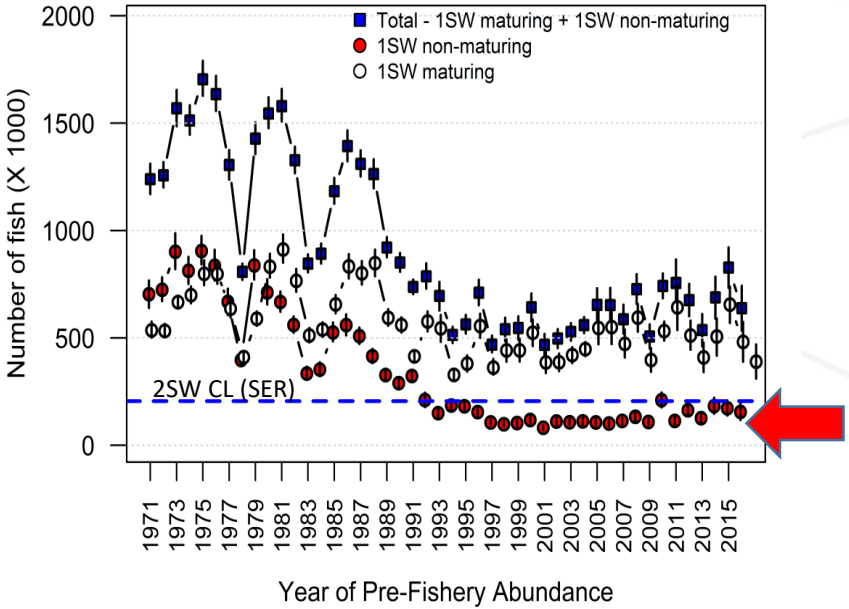
Risk Assessment Framework

- Full Reproductive Capacity :
  - lower bound of the 90% confidence interval of the estimate above reference point
  - equivalent to a probability of at least 95% of meeting reference point
- At Risk of Suffering Reduced Reproductive Capacity:
  - lower bound of the confidence interval is below reference point, but the midpoint is above
- Suffering Reduced Reproductive Capacity:
  - midpoint is below reference point



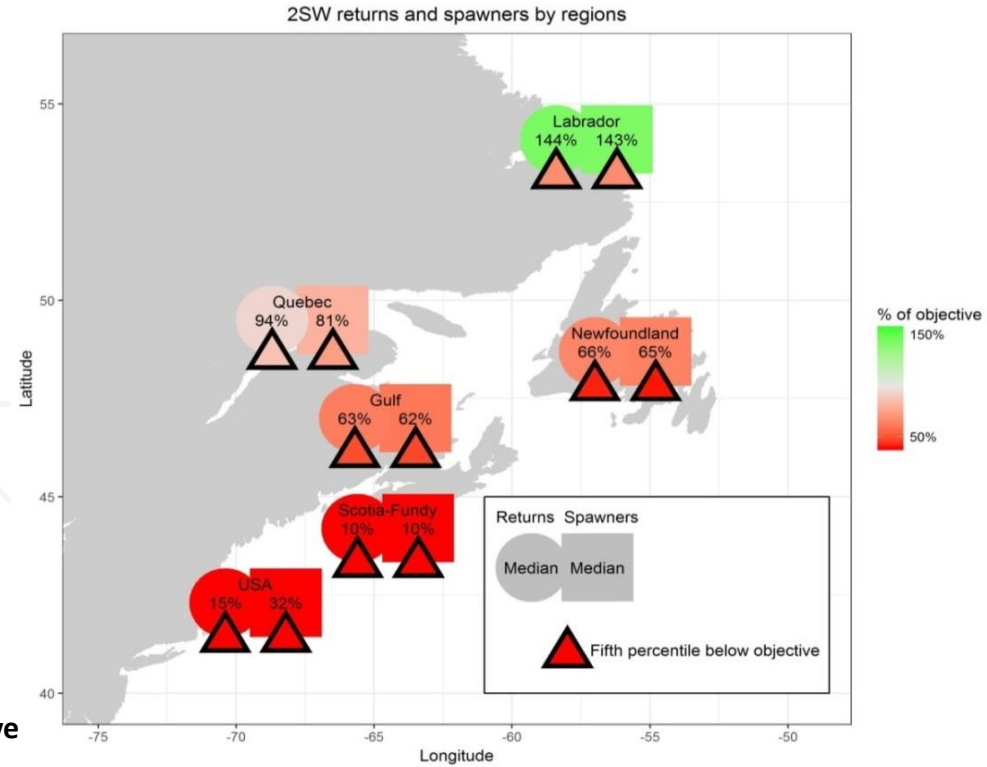
3.3 Status of Stocks: Pre-Fishery Abundance (PFA)

- Number of 1SW salmon on 1 August of the second summer at sea (sal.21.nac: Figure 11)
  - 1 SW non-maturing
  - 1SW maturing
- Estimates of recruitment (PFA) suggest continued low abundance of North American salmon (suffering reduced reproductive capacity)
- Recruitment of the 1SW cohort for the 2016 PFA year was 638 250 fish; abundance declined by 63% over the time-series from peak in 1975 of 1 705 000 fish.



3.3 Status of Stocks: By Region

- sal.21.nac: Figure 12
- 2017, 2SW median estimates of returns to rivers and spawners below CLs for all regions except Labrador, and are therefore suffering reduced reproductive capacity
- Labrador at risk of suffering reduced reproductive capacity
- Particularly large deficits relative to CLs and rebuilding/management objectives are noted for Scotia-Fundy and USA regions



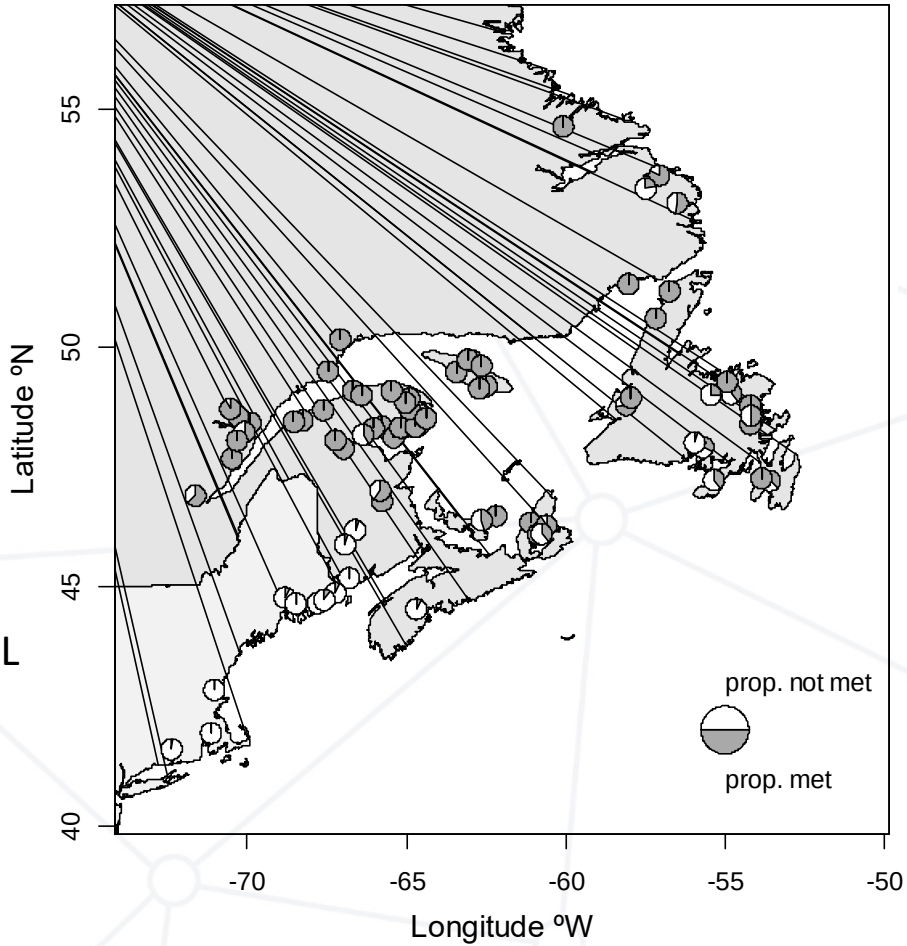
> 100 **Full reproductive capacity**

> 100 **Risk suffering reduced reproductive capacity**

< 100 **Suffering reduced reproductive capacity**

3.3 Status of Stocks: Proportion CL Attained

- sal.21.nac: Figure 13
- Egg depositions for 84 rivers in 2017
- 42 of 84 (50%) achieved or exceeded CLs
- 30 rivers achieved less than 50% CL
- Canada
  - rivers assessed annually ranged from 61 to 91
  - annual percentages of these rivers achieving CL ranged from 26% to 67% (62% in 2017)
  - no temporal trend (sal.21.nac: Figure 7)
- USA
  - None of the assessed rivers achieve CLs



3.3 Status of Stocks: Summary

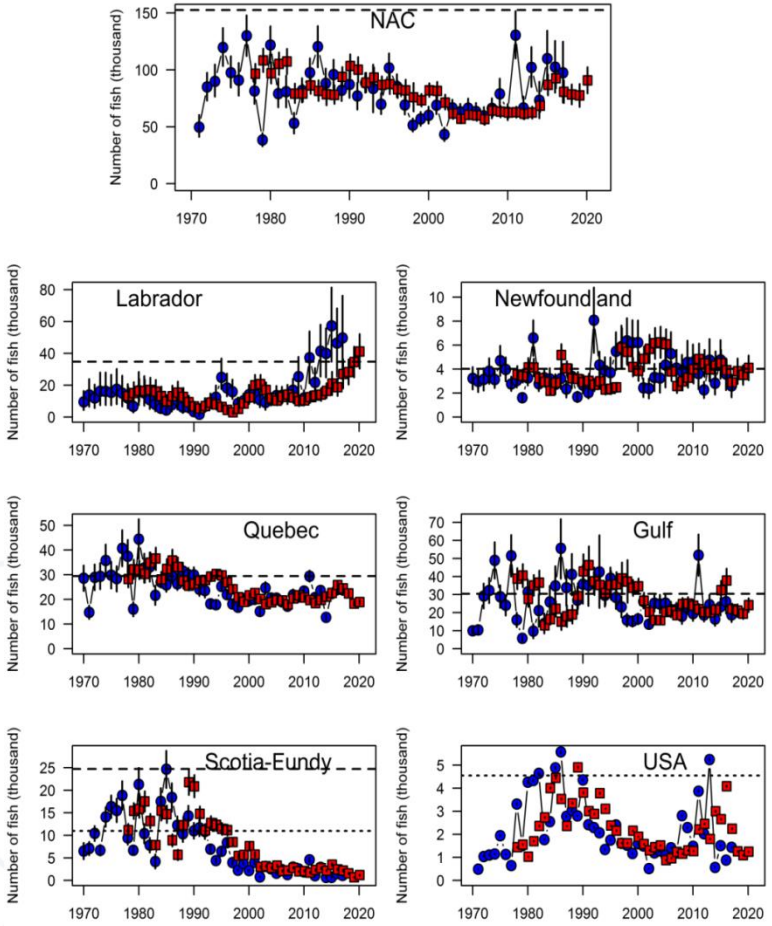
- Despite major management changes and increasingly more restrictive fisheries, returns have remained near historical lows, except for returns to Labrador and Newfoundland
- All salmon populations within the USA and the Scotia-Fundy regions have been or are being considered for listing under country specific species at risk legislation
- Factors other than fisheries constraining production
- Declines in smolt production in some rivers of eastern Canada may also be contributing to lower adult abundance

3.4 Catch Options:
Multi-Year Catch Agreement 2015-2018

- NASCO 2015 multi-year regulatory agreement for the West Greenland salmon fishery (http://www.nasco.int/pdf/2015%20papers/WGC_15_21.pdf)
- 2018 is the third year and final year of this agreement
- A full assessment of stock status and catch advice was conducted to inform a potential new multi-year agreement

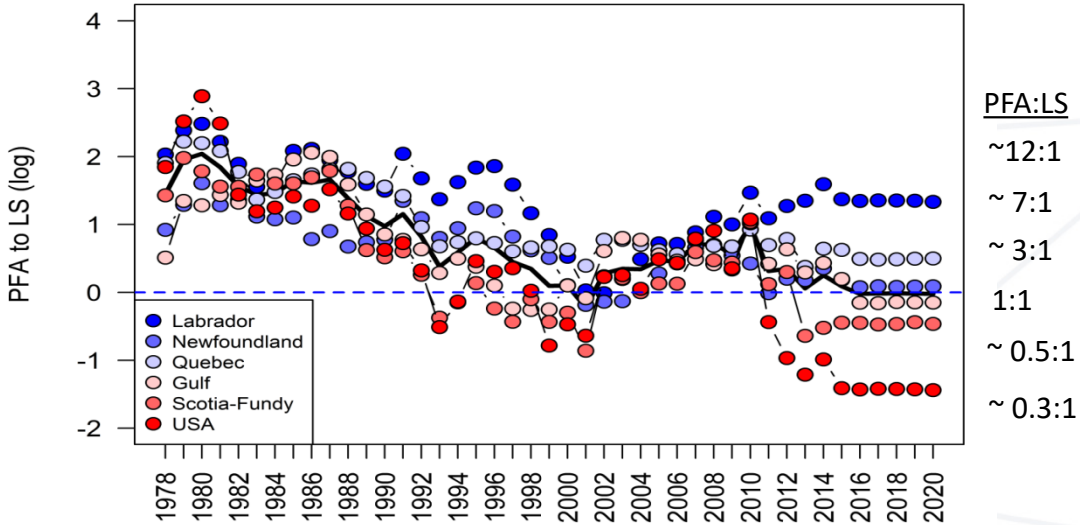
3.4 Forecast and Catch Options

- Catch options for mixed-stock fisheries 2018-2021 provided for non-maturing 1SW and maturing 2SW
  - Maturing 1SW not fished outside homewaters
- 2SW Spawners and Lagged Spawners
  - sal.21.nac: Figure 14
  - 2SW Spawners (blue circle) – year of spawning
  - 2SW and Lagged Spawners (red square) – year of PFA



3.4 Catch Options

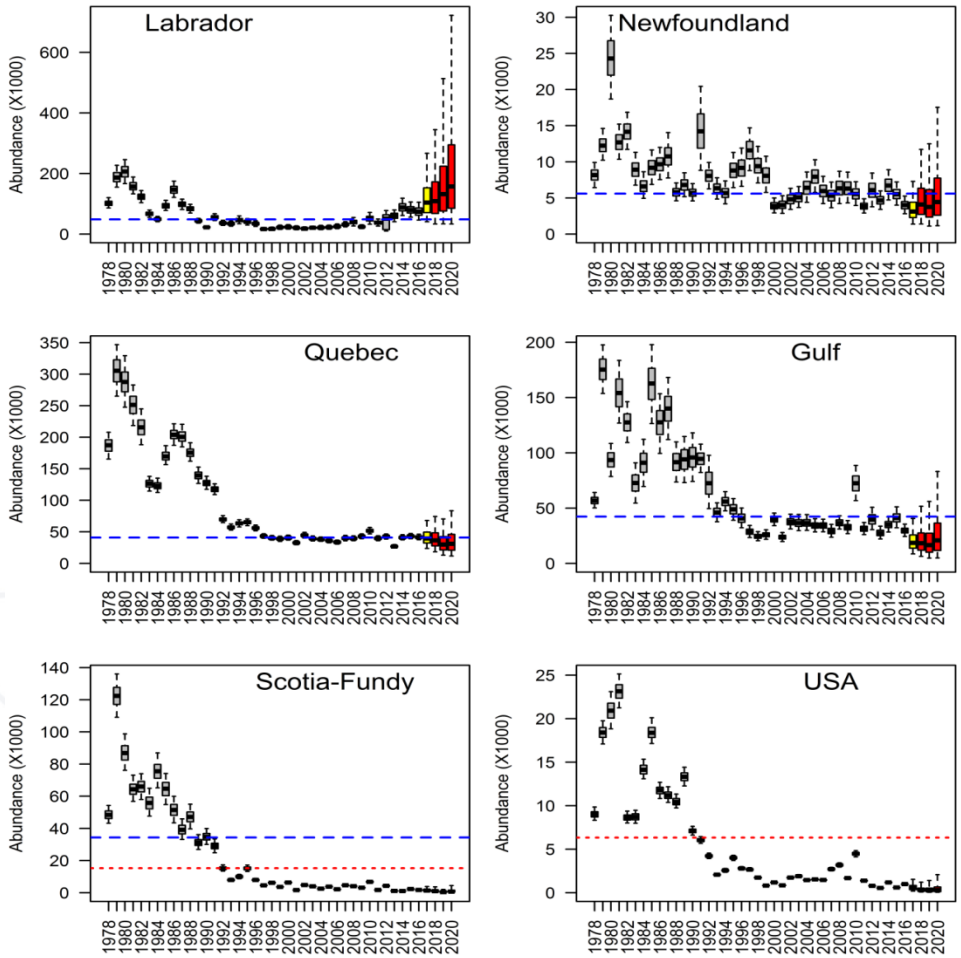
- Productivity coefficient (log of PFA to LS) 1978-2020 - sal.21.nac: Figure 15
  - negative productivity parameters (log scale) indicate that PFA is less than lagged spawners
  - salmon abundances in these regions are expected to continue to decline



3.4 Catch Options: 2SW PFA

2SW PFA 2017-2020:
(sal.21.nac: Figure 16)

- Labrador – at risk of suffering reduced reproductive capacity
- All other regions suffering reduced reproductive capacity



CL (SER)
Management Objective

3.4 Catch Options

- All regions have less than 95% probability of achieving 2SW objective (CL or Management Objective)
- Probability of simultaneous attainment in any year is 0%
- Therefore, no mixed-stock fishery options on 1SW non-maturing salmon in the period 2018 to 2020 or 2SW salmon in the period 2018 to 2021

sal.21.nac: Table 4

Region	Region specific 2SW objective	Probability of meeting the 2SW objectives in the absence of fisheries for the 2SW return year			
		2018	2019	2020	2021
Labrador	34 746	0.826	0.871	0.888	0.898
Newfoundland	4 022	0.100	0.308	0.289	0.392
Quebec	29 446	0.391	0.387	0.271	0.316
Gulf	30 430	0.033	0.087	0.102	0.194
Scotia-Fundy	10 976	0.000	0.001	0.000	0.003
USA	4 549	0.000	0.001	0.002	0.006
Simultaneous to North America		**0.000**	**0.000**	**0.000**	**0.000**

3.5 Framework of Indicators (FWI)

- FWI used in support of multi-annual catch options in the North American Commission and West Greenland Commissionwas updated in 2018
  - 21 indicator variables (e.g. marine survival and return rates)
  - 13 rivers
  - No indicator variables were retained for the Labrador or Newfoundland
- FWI can be applied for the next two years, in January 2019 and 2020, based on new assessment data in 2018 and 2019 (e.g. survival rate, returns) to evaluate the appropriateness of the advice

Relevant data deficiencies, monitoring needs, and research requirements

- Complete and timely reporting of catch and effort data from all fisheries of eastern Canada
- Improved sampling of the Labrador and Saint Pierre and Miquelon fisheries
    - throughout the fishing season and in all areas to ensure representative of the entire catch
- Additional monitoring be considered in Labrador to estimate stock status for that region
    - Efforts should also be undertaken to evaluate the utility of other data sources (e.g. Indigenous and recreational catches and effort) to describe stock status in Labrador

(Full list in sal.oth.nasco: Section 1.5)

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