

Presentation of the ICES Advice on Atlantic Salmon from North America to
the North American Commission
NAC(21)09

sal.nac.all
**Atlantic salmon in the North American
Commission Area in 2020**



Photo by Nick Hawkins

Terms of Reference



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

- 3.1 describe the key events of the 2020 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 2021 – 2024 with an assessment of risks relative to the objective of exceeding stock conservation limits, or pre-defined NASCO Management Objectives, and advise on the implications of these options for stock rebuilding ; 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 2020 Fisheries: Catch



- North America: 106 t
 - 104 t Canada
 - 2 t Saint Pierre and Miquelon (France)
 - 0 t USA

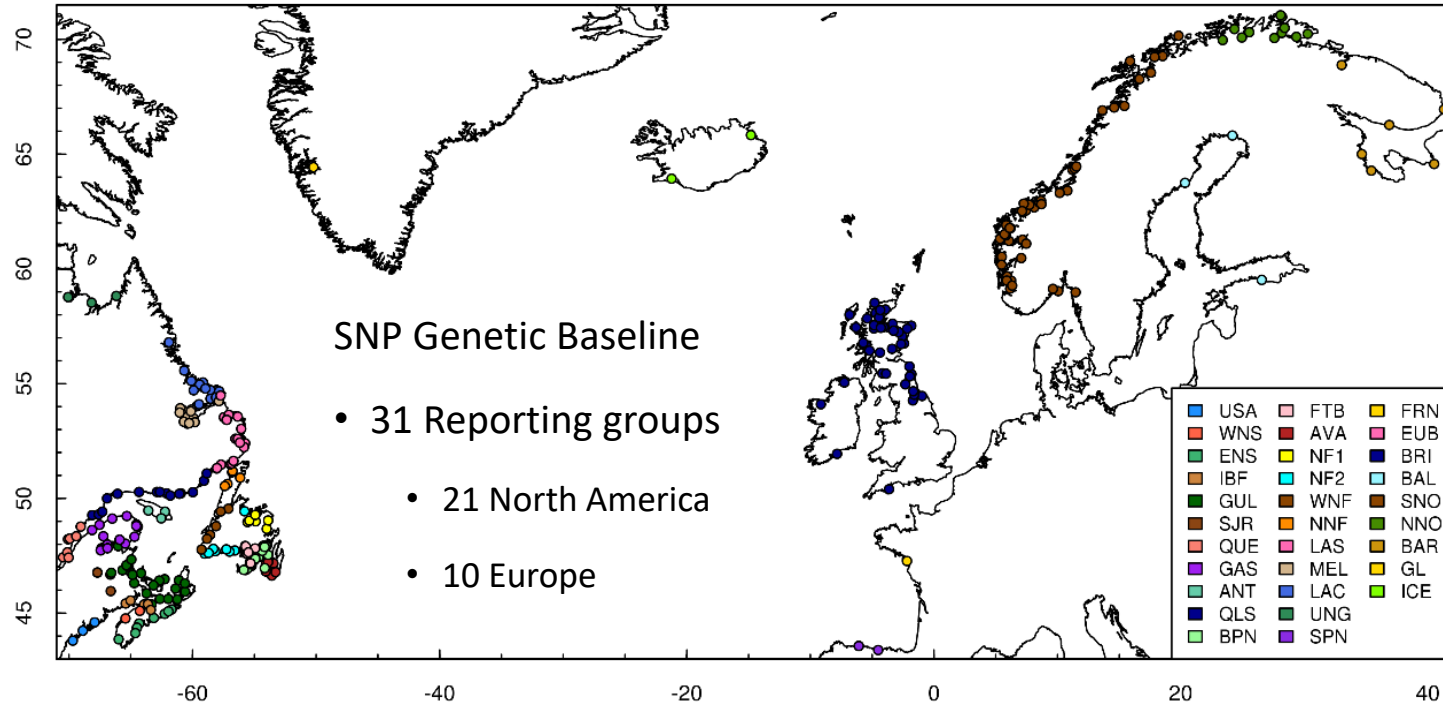
Table 1: sal.nac.all

2020	Canada					St Pierre & Miquelon (SPM)	USA	North America
	Commercial	Indigenous (FSC)	Labrador Resident	Recreational	Total			
Reported* catch	0 t	59 t	2 t	44 t	104 t	2 t	0 t	106 t
% of NAC total	0%	56%	2%	42%	98%	2%	0%	100%
Unreported catch	27 t					na	0 t	27 t
Location of catches								
% in-river	51%					0%		50%
% in estuaries	42%					0%		42%
% coastal	7%					100%		8%

* = provisional until 2022

3.1 Origin and Composition of Catches

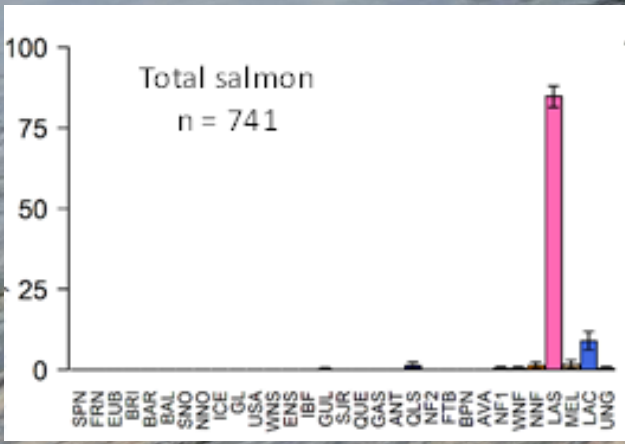
Figure 4: sal.nac.all



3.1 Origin and Composition of Catches: Labrador



Figure 5: sal.nac.all



- 2020:
- 741 scale and tissue samples collected
 - 9% of harvest by number
 - emphasis on samples from coastal areas where interception of non-local stocks more prevalent
 - > 98% assigned to Labrador genetic groups
 - no USA origin salmon detected in 2019 and 2020

3.1 Origin and Composition of Catches: Saint Pierre and Miquelon



2020:

- 116 scale and tissue samples
- 19% of harvest by number
- Received too late for genetic analysis
- Reported on in 2022

3.2 Stock Conservation Limits (CLs)

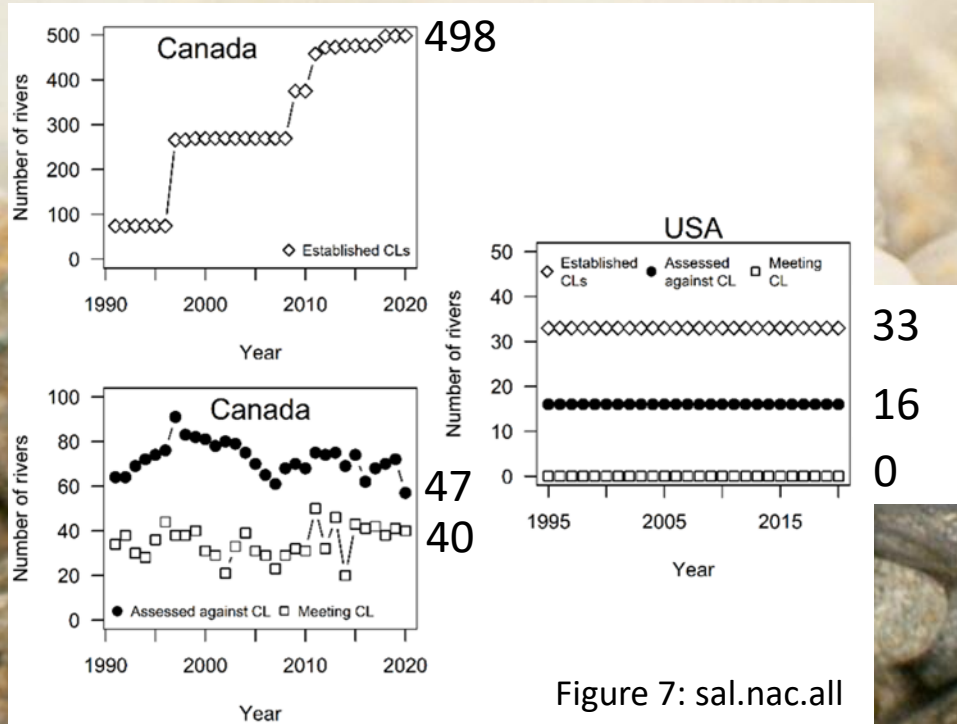


Figure 7: sal.nac.all

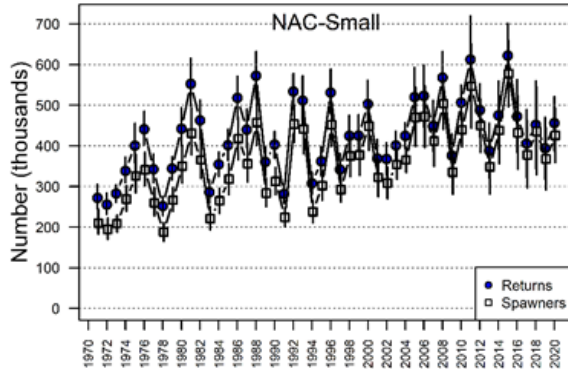
3.3 Salmon Returns



Small Salmon (1SW)

- 456,100
- 37% increase on 2019
- three of six geographical regions declined from 2019
- 88% to Newfoundland and Labrador

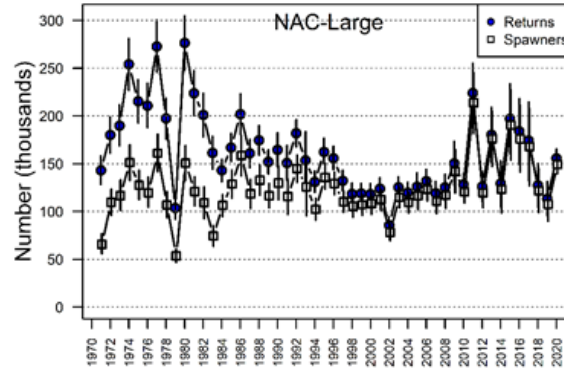
Figure 7: sal.nac.all



Large Salmon (MSW and repeats)

- 155,600
- 50% increase on 2019
- one of six geographical regions (NF) declined from 2019
- 82% to Labrador, Quebec and Gulf

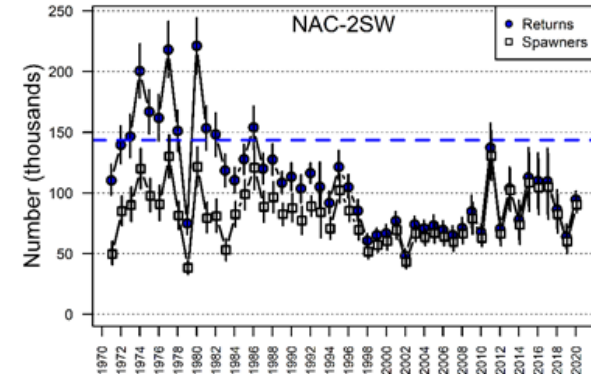
Figure 8: sal.nac.all



2SW Salmon (subset of Large)

- 94,700
- 58% increase on 2019
- one of six geographical regions (NF) declined from 2019
- 94% to Labrador, Quebec and Gulf

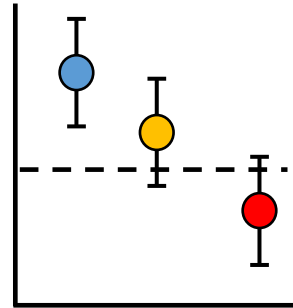
Figure 9: sal.nac.all



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

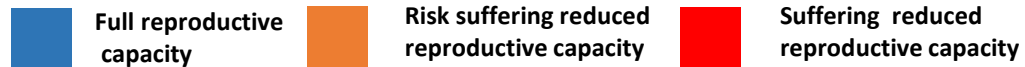
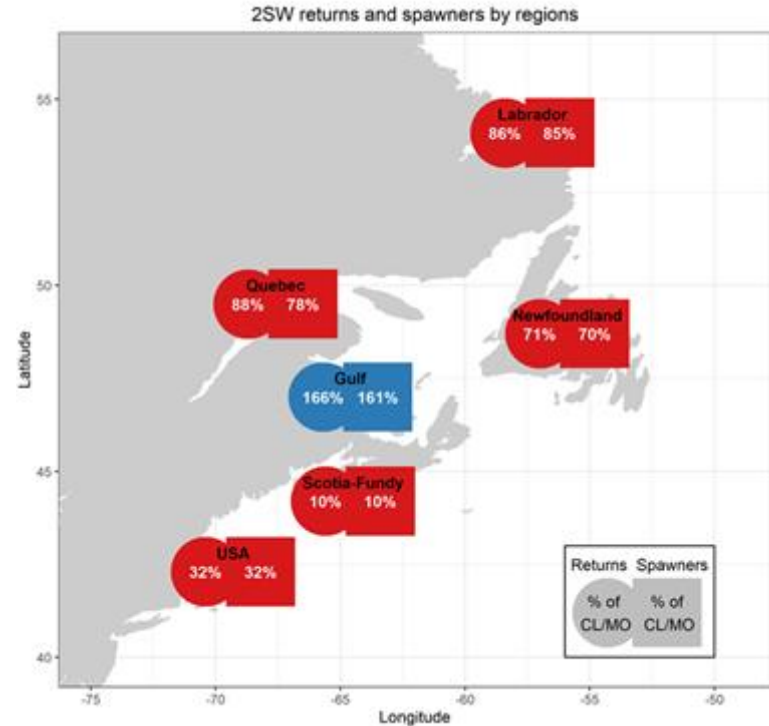


3.3 Status of Stocks: By Region

2020:

- 2SW returns and spawners suffering reduced reproductive capacity in five out of six assessment regions
- Particularly large deficits are noted for Scotia-Fundy (10%) and USA regions (32%)

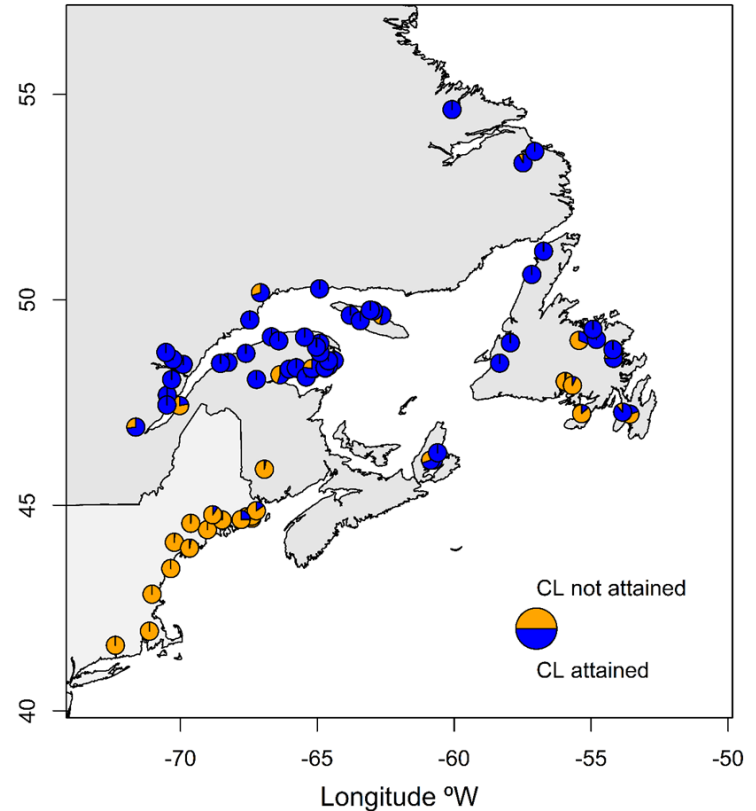
Figure 10: sal.nac.all



3.3 Degree of CL Attainment

- Proportion CL Attained = egg deposition / CL
 - 40 of 73 (55%) achieved or exceeded CLs
 - 23 of 79 (32%) were at, or less, than 50% CL
- Canada
 - 1991-2020 CL time-series
 - Number of rivers assessed ranged from 61 to 91
 - percentage rivers achieving CL ranged from 26% to 67%
- USA
 - None of the assessed rivers have achieved CLs

Figure 11: sal.nac.all

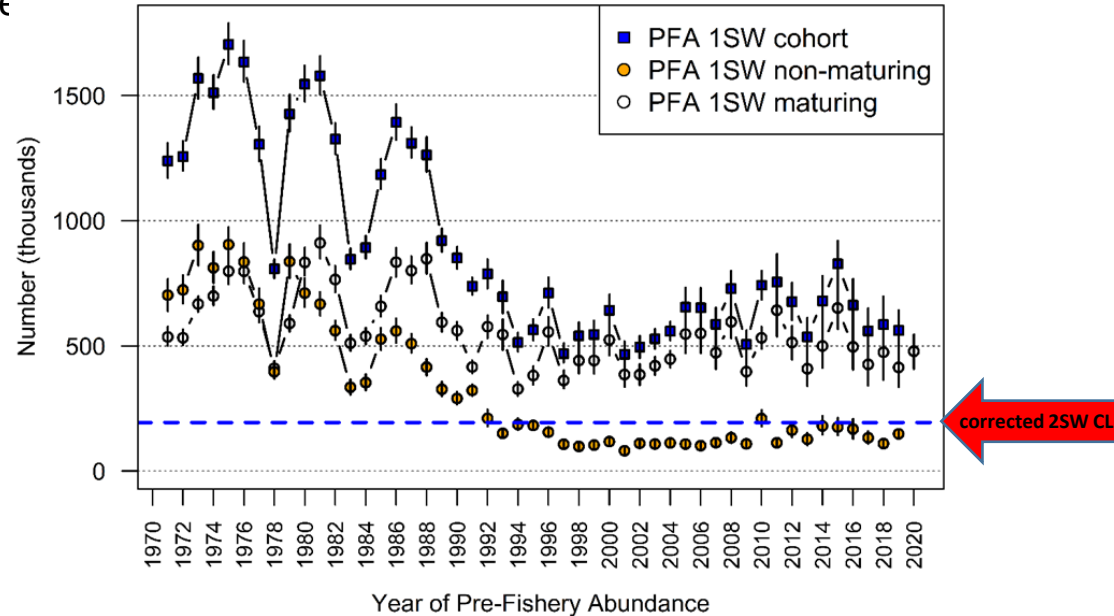


3.3 Pre-Fishery Abundance (PFA)



Figure 12: sal.nac.all

- PFA: salmon at sea prior to all marine fishes (1 August second summer at sea)
 - Two components:
 - 1SW maturing (return as 1SW)
 - 1SW non-maturing (return as MSW)
- 2019 PFA year was 562 400 fish
 - declined 66% over the time-series
 - suffering reduced reproductive capacity



3.4 Catch options or alternative management advice

- Catch options for mixed-stock fisheries are only provided for the non-maturing 1SW and maturing 2SW components as the maturing 1SW component is not fished outside home waters

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

Table 4: sal.nac.all

- No probabilities (close to 0) that the returns of 2SW salmon to the six regions of NAC will meet or exceed the 2SW objectives for the six regions in NAC and simultaneously for all regions
- No 2021-2024 catch options

3.4 Catch options or alternative management advice



Region specific catch options

- Lagged 2SW spawners (1SW PFA – fisheries and natural mortality)
- Below CL for NAC, but improving 2020-2023
- Improvements regionally in Labrador and Gulf

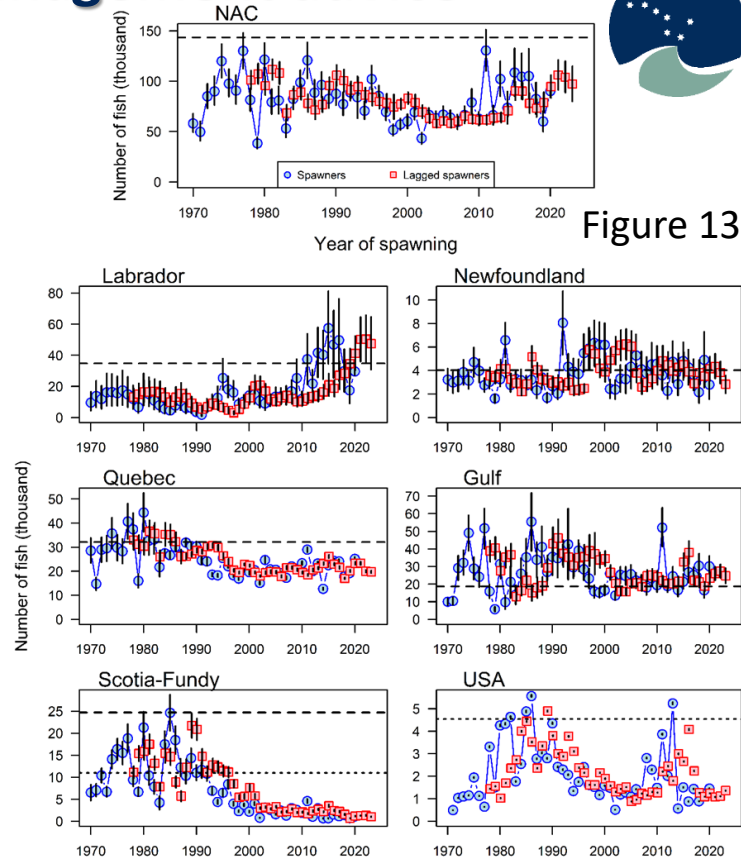


Figure 13: sal.nac.all

3.4 Catch options or alternative management advice

Forecast of productivity

- Estimated positive PFA/Lagged 2SW spawners ratio all regions
- PFA higher than LS that produced it
- Abundance expected to increase...
-if positive production and LS are maintained

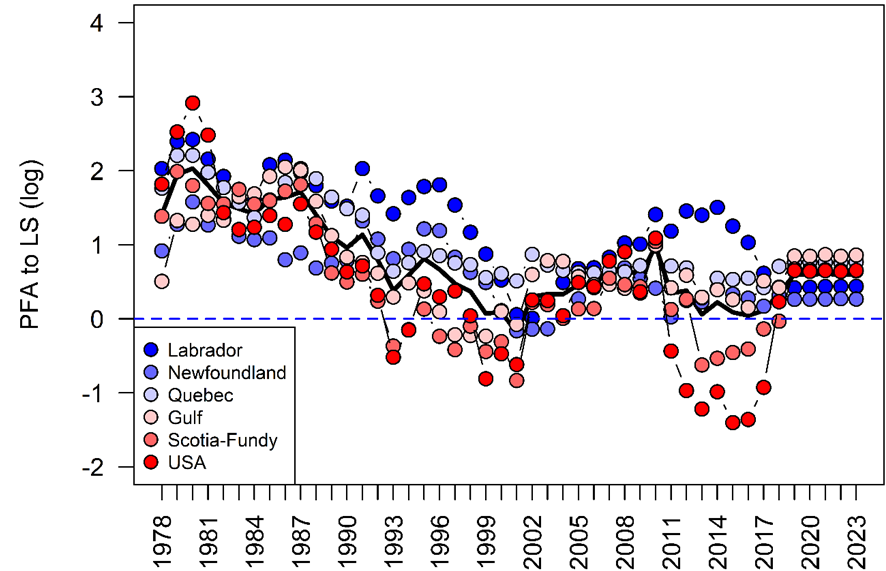


Figure 14: sal.nac.all

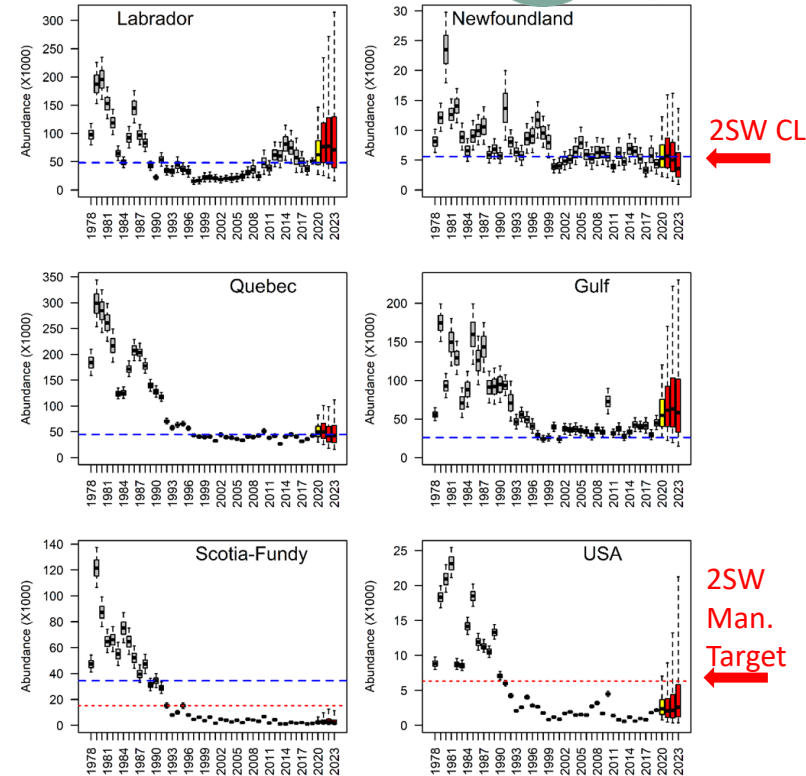
3.4 Catch options or alternative management advice



Figure 15: sal.nac.all

Regional PFA 1978-2020 and PFA forecast 2021-2024

- 5th percentiles of the posterior distributions of the regional PFAs are less than the management objective reserves for all six regions
- No mixed-stock fishery options on 1SW non-maturing salmon in the period 2021 to 2023
- No mixed-stock fishery options on 2SW maturing salmon in the period 2021 to 2024



3.5 Update the Framework of Indicators



- Used to identify any significant change in the previously provided multi-annual management advice
- Used in NAC (only NAC indicators used) and WGC

- ✓ Updating indicator variables
- ✓ Running the objective function spreadsheet for each indicator variable and the variable of interest relative to the management objectives
- ✓ Quantifying the threshold values for the indicator variables
- ✓ Revising/adding the indicator variables
- ✓ Providing the spreadsheet for FWI assessment
- ✓ 19 variables, 13 rivers, none from NF or Lab

Catch advice: Catch option = 0 (Yes = 1, No = 0)

Overall Recommendation: No Significant Change Identified by Indicators

Geographic Area	River/ Indicator	2020 Value*	Ratio Value to Threshold	Threshold	True Low	True High	Indicator State	Probability of Correct Assignment	Indicator Score	Management Objective Met?	
USA	Penobscot 25W Returns	988	48%	2 167	100%	100%	-1	1.00	-1.00		
	Penobscot 25W Survival (%)	0.002	18%	0.011	100%	60%	-1	1.00	-1.00		
	possible range				-1.00	0.60					
	Average		32%						-1.68	No	
Scotia Fundy	Saint John Return Large	115	3%	3 329	97%	100%	-1	0.97	-0.97		
	Lahave Return Large	22	8%	285	82%	85%	-1	0.82	-0.82		
	North Return Large	226	39%	626	96%	79%	-1	0.96	-0.96		
	Saint John Return Small	241	11%	2 276	90%	80%	-1	0.90	-0.90		
	Lahave Return Small	278	17%	1 679	96%	67%	-1	0.96	-0.96		
Average		15%		-0.02					-0.32	No	
Gulf	Miramichi Return 25W	4748	57%	8 366	100%	98%	-1	1.00	-1.00		
	Miramichi Return 15W	6792	39%	24 287	58%	92%	-1	0.58	-0.58		
	possible range				-0.79	0.68				-0.79	No
Average		48%									
Quebec	Bonaventure Return Large	1531	68%	2 243	73%	100%	-1	0.73	-0.73		
	Grande Riviere Return Large	426	99%	442	100%	83%	-1	1.00	-1.00		
	Saint-Jean Return Large	814	80%	1013	79%	100%	-1	0.79	-0.79		
	Dartmouth Return Large	869	118%	736	86%	79%	1	0.75	0.75		
	Madeline Return Large	922	137%	672	94%	74%	1	0.74	0.74		
	Sainte-Anne Return Large	790	134%	594	82%	60%	1	0.60	0.60		
	Mitis Return Large	673	237%	289	89%	50%	1	0.50	0.50		
	De la Trinité Return Large	113	29%	385	88%	100%	-1	0.88	-0.88		
De la Trinité Return Small	160	28%	578	90%	83%	-1	0.90	-0.90			
De la Trinité 25W Survival	0.238	57%	0.49	100%	68%	-1	1.00	-1.00			
possible range				-0.68	0.60						
Average		98%							-0.27	No	
Newfoundland	possible range									NA	Unknown
Average										NA	Unknown
Labrador	possible range									NA	Unknown
Average										NA	Unknown
Southern NEAC	possible range									NA	Unknown
Average										NA	Unknown

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

Figure 16: sal.nac.all