	Council <i>Annual Progress Report on Actions taken under the Implementation Plan for the Calendar Year 2023 Canada</i>	CNL(24)39
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Annual Progress Report on Actions taken under the Implementation Plan for the Calendar Year 2023

The Annual Progress Reports allow NASCO to evaluate progress on actions taken by Parties / jurisdictions to implement its internationally agreed Resolutions, Agreements and Guidelines and, consequently, the achievement of their objectives and actions taken in accordance with the Convention. The following information should be provided through the Annual Progress Reports:

- any changes to the management regime for salmon and consequent changes to the Implementation Plan;
- actions that have been taken under the Implementation Plan in the previous year;
- significant changes to the status of stocks, and a report on catches; and
- actions taken in accordance with the provisions of the Convention.

*In completing this Annual Progress Report please refer to the **Guidelines for the Preparation and Evaluation of NASCO Implementation Plans and for Reporting on Progress, CNL(18)49.***

These reports will be reviewed by the Council. Please complete this form and return it to the Secretariat **no later than 1 April 2024.**

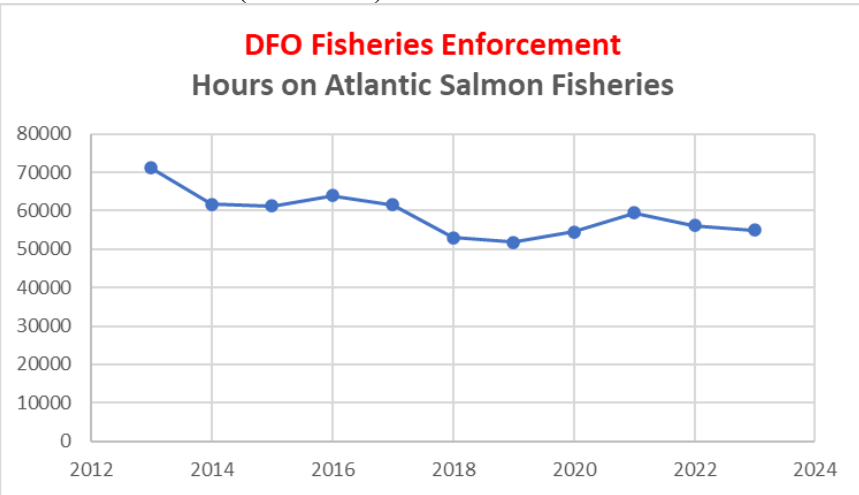
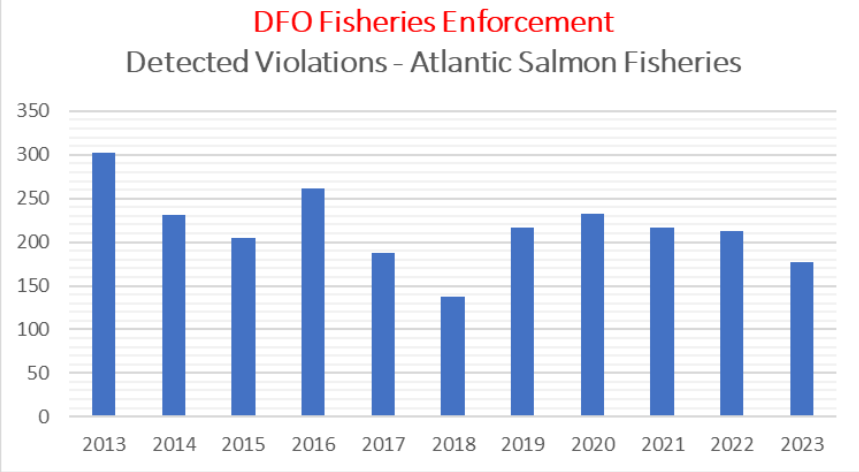
Party:	Canada
Jurisdiction / Region:	

1: Changes to the Implementation Plan
1.1 Describe any proposed revisions to the Implementation Plan (<i>Where changes are proposed, the revised Implementation Plans should be submitted to the Secretariat by 1 November.</i>)
Canada did not submit a revised Implementation Plan in November 2023. Canada does not anticipate undertaking further revisions in autumn 2024, unless significant changes to policies and/or programs are made in 2024.
1.2 Describe any major new initiatives or achievements for salmon conservation and management that you wish to highlight.
After having conducted extensive consultative activities in 2022, Canada published in 2023 a What We Heard report that was used to refine Canada's draft Wild Atlantic Salmon Conservation Strategy, which is expected to be finalized in 2024.
2: Stock status and catches.
2.1 Provide a description of any new factors that may affect the abundance of salmon stocks significantly and, if there has been any significant change in stock status since the

development of the Implementation Plan, provide a brief (200 word max) summary of these changes.				
The continued low and declining abundance of salmon stocks in Canada, despite significant fishery reductions, strengthens the conclusions that factors acting on survival in the first and second years at sea, at both local and broad ocean scales, are constraining abundance of Atlantic salmon. Declines in smolt production in some Canadian rivers are now being observed and are also contributing to lower adult abundance.				
2.2 Provide the following information on catches: (nominal catch equals reported quantity of salmon caught and retained in tonnes ‘round fresh weight’ (i.e. weight of whole, ungutted, unfrozen fish) or ‘round fresh weight equivalent’).				
(a) provisional nominal catch (which may be subject to revision) for 2023 (tonnes)	In-river	Estuarine	Coastal	Total
	33.0	47.7	7.3	88.0
(b) confirmed nominal catch of salmon for 2022 (tonnes)	41.4	41.9	6.9	90.2
(c) estimated unreported catch for 2023 (tonnes)	N/A	N/A	N/A	16.4
(d) number and percentage of salmon caught and released in recreational fisheries in 2023	Provisional 2023: 42,595 salmon released comprising: 21,845 small salmon (FL < 63 cm) and 20,750 large salmon (FL ≥ 63 cm) Confirmed values for 2022: 52,127 salmon released comprising: 29,083 small salmon (FL < 63 cm) and 23,044 large salmon (FL ≥ 63 cm)			
3: Implementation Plan Actions.				
3.1 Provide an update on progress on actions relating to the Management of Salmon Fisheries (section 2.9 of the Implementation Plan).				
<i>Note: the reports under ‘Progress on action to date’ should provide a brief overview of each action. Please report in relation to the reporting year only or the most relevant recent year. For all actions, provide clear and concise quantitative information to demonstrate progress. In circumstances where quantitative information cannot be provided for a particular action because of its nature, a clear rationale must be given for not providing quantitative information and other information should be provided to enable progress with that action to be evaluated. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.</i>				
Action F1:	Description of action (as submitted in the IP)	Improve understanding of factors affecting survival of salmon at sea, to inform management Throughout the North Atlantic, survival at sea of salmon has declined, particularly for populations in the southern and mid-range of the species. There is still no comprehensive understanding of why marine survival is lower than in previous decades. For example, predation factors hypothesized to be contributing to increased mortality, and which could potentially be managed include: predation by native fish such as striped bass; Atlantic cod on out-migrating smolt; seal predation on returning adult		

		<p>salmon in estuaries and rivers; and changes/reductions in the salmon food base (capelin, herring) that are also subject of fishing pressure.</p> <p>Research focused on the identification of the factors that are contributing to reduced sea survival is required to determine if fisheries management actions may contribute to improving marine survival. Even without a complete understanding of the mechanisms involved, scientific information enabling the prediction of salmon returns from the sea could improve management practices.</p>
	Expected outcome <i>(as submitted in the IP)</i>	The objective of the ASRJV Science Plan is to guide the strategic planning and implementation of science initiatives in eastern North America that lead to improved understanding of the trends and causes of variation and/or decline in the abundance and distribution of wild Atlantic salmon.
	Approach for monitoring effectiveness & enforcement <i>(as submitted in the IP)</i>	Annual reporting of research activities to the ASRJV Science Committee and Management Board.
	Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i>	In 2023, the Atlantic Salmon Research Joint Venture (ASRJV) continued to expand its collaborative network across the Atlantic salmon science community both domestically and internationally, and secured funding for a number of new research and data initiatives, including a novel Data Mobilization Program. This program is seeking to identify, catalogue, digitize and standardize important, unused existing Atlantic salmon data and make it openly accessible through quality assurance and quality control database partnerships, improving the overall availability and usefulness of historical data to future projects. Funding will also allow for sample analysis to move forward in the collaborative multi-year research project, “Linking freshwater habitat conditions to Atlantic salmon marine survival” in 2024. Analysis of genetic and transcriptomic samples collected in 2021-22 will answer questions regarding the potential occurrence of genetic selection in marine survival. The JV Student Hub produced its first publication since its initiation in 2022, titled: “The impacts of diel thermal variability on growth, development and performance of wild Atlantic salmon (<i>Salmo salar</i>) from two thermally distinct rivers” (Sean Andrew, et al., Conservation Physiology). The Hub also continued to support Master’s, PhD, and post-doctorate students through the three projects initiated in 2022, and two additional ones: (1) Assessing stable isotopes of out-migrating Atlantic salmon smolts across regional populations in Eastern Canada to examine trophic ecology and condition; and (2) Combined impacts of climate change and hybridization from escaped aquaculture fish on wild Atlantic salmon populations in Newfoundland
	Current status of action <i>(Please note: ‘Completed’ means that the overall action is complete for the lifetime of the third reporting</i>	Ongoing

	<p><i>cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i></p>																
	<p>If 'Completed', has the action achieved its objective?</p>																
<p>Action F2:</p>	<p>Description of action (as submitted in the IP)</p>	<p>Action against illegal fishing</p> <p>Newfoundland and Labrador Region will combat illegal salmon fishing activities based on strategic patrol plans developed with Intelligence Led Special Operations in cooperation with the inland guardian program, including deploying 90 Inland Fishery Guardians, three Marine Fishery Guardians, and 14 Aboriginal Fishery Guardians. These strategic operations will continue before, during and post-season. DFO plans to deploy these staff for a minimum 60,000 hours, conducting a minimum of 3,400 inspections/year. Provincial Wildlife Enforcement Officers and DFO will support both regular patrols and special operations.</p> <p>Gulf and Maritimes regions have developed mapping software that contains historical angling activity along certain rivers in its regions and provide key information to enforcement officers about areas with illegal activity, creating more effective patrol planning and use of enforcement resources. The first river system where this pilot project has been implemented is the Saint John River, New Brunswick. The Miramichi River system will be added in the near future.</p> <p>Even though all but three rivers in the Maritimes Region have been closed to salmon angling, catch and release became a practiced activity on a number of other major salmon rivers under the guise of angling for trout and smallmouth bass. DFO will continue to impose complete angling closures in important salmon holding pools and, in some cases, closures of 20 kilometres or more on specific rivers (Medway, Nova Scotia, and Tobique, New Brunswick).</p> <p>A new IT system is being developed to improve catch registration and regulatory compliance monitoring in Quebec. Wildlife protection officers continue to fight against salmon poaching with the collaboration of wildlife protection assistants from controlled harvesting zones (ZEC).</p> <p>DFO will continue to use social media in order to emphasize the consequences to salmon stocks of illegal activities and bring awareness to the penalties. Planned Surveillance deployments by Region for 2019-2024:</p> <p>Planned Surveillance deployments by Region for 2019-2024:</p> <table border="1" data-bbox="547 1787 1248 1995"> <thead> <tr> <th></th> <th>Patrol Hours</th> <th>Inspections</th> </tr> </thead> <tbody> <tr> <td>NL</td> <td>48,000</td> <td>3,500</td> </tr> <tr> <td>Gulf</td> <td>6,400</td> <td>500</td> </tr> <tr> <td>Maritimes</td> <td>4,600</td> <td>300</td> </tr> <tr> <td>Quebec</td> <td>40,000</td> <td>No specific objectives</td> </tr> </tbody> </table>		Patrol Hours	Inspections	NL	48,000	3,500	Gulf	6,400	500	Maritimes	4,600	300	Quebec	40,000	No specific objectives
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	Expected outcome <i>(as submitted in the IP)</i>	Deterrence of illegal activity will be achieved through increased ability to detect such activities and by publicizing penalties on social media associated with resulting prosecutions.																				
	Approach for monitoring effectiveness & enforcement <i>(as submitted in the IP)</i>	Measuring planning effectiveness will be accessed through post-season reviews of fishing activity, including reported and observed poaching activity, annual reporting of enforcement activities, observations, bycatch and prosecutions, including analysis of trends over the time period.																				
	Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i>	<p>Enforcement trends (2013-2023)</p>   <p>The following table provides more detailed information on activities in 2023, by DFO region for three of the Atlantic regions.</p> <table border="1" data-bbox="550 1736 1428 1960"> <thead> <tr> <th>DFO Region</th> <th>Hours</th> <th>Fishers Checked</th> <th>Fishing Site Checked</th> </tr> </thead> <tbody> <tr> <td>GULF</td> <td>5,544</td> <td>1,466</td> <td>6,090</td> </tr> <tr> <td>MARITIMES</td> <td>2,289</td> <td>452</td> <td>2,066</td> </tr> <tr> <td>NFLD & LAB</td> <td>47,143</td> <td>4,382</td> <td>16,969</td> </tr> <tr> <td>Total</td> <td>55,037</td> <td>6,300</td> <td>25,126</td> </tr> </tbody> </table>	DFO Region	Hours	Fishers Checked	Fishing Site Checked	GULF	5,544	1,466	6,090	MARITIMES	2,289	452	2,066	NFLD & LAB	47,143	4,382	16,969	Total	55,037	6,300	25,126
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		In the Province of Quebec, the development of a new IT system to improve catch registration and regulatory compliance monitoring is ongoing. The regulation is currently being modified to allow online catch registration. The catch and release salmon angling licence can now be purchased online. Wildlife protection officers continue to fight against salmon poaching with the collaboration of wildlife protection assistants from controlled harvesting zones (ZEC). The total number of patrol hours in Quebec in 2023 was 41,026.
	Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i>	Ongoing
	If 'Completed', has the action achieved its objective?	
Action F3:	Description of action <i>(as submitted in the IP)</i>	Warm water protocols for adaptive management of recreational fisheries Due to the warming of waters and the trends of declining returns of Atlantic salmon in the rivers of Eastern Canada, a number of measures have been put in place to limit fishing activity and to reduce fish mortality. The most significant measure is the use of warm water protocols to reduce stress on salmon during summer months. Warm water protocols for wild Atlantic recreational fisheries have been developed for some jurisdictions in eastern Canada (rivers of Gulf Region and all rivers in Newfoundland and Labrador) and are expected to be developed for other rivers (e.g., rivers with documented problems in Quebec), where they can be proven to function as a useful tool in supporting decisions to promote sustainability of the stocks.
	Expected outcome <i>(as submitted in the IP)</i>	Increased number of rivers with warm water protocol in Canada, and a reduction in the number and proportion of salmon that die as a result of catch and release associated with warm water conditions.
	Approach for monitoring effectiveness & enforcement	Effectiveness will be assessed at the end of season in order to modify/refine protocols as needed.

	<i>(as submitted in the IP)</i>	
	<p>Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i></p>	<p>Recreational fisheries are managed at the regional level in Canada, using slightly different approaches, therefore, outcomes are reported in this section separately for each region.</p> <p>In 2023, there was no increase in the number of rivers having warm water protocols. Existing warm water protocols continued to be used, as needed, for the adaptive management of recreational fisheries in all regions.</p> <p>Newfoundland and Labrador (NL) Region monitored all 190 scheduled salmon rivers and environmental protocols are in place on all scheduled rivers. NL Region is not planning to monitor additional rivers during this reporting cycle. Work is underway to improve efficiency through increased use of real time temperature monitoring devices. Temperature thresholds in class 0 rivers (where no fish may be retained) are lower (18 degrees) compared to retention rivers (20 degrees), to further reduce the number of salmon that die as a result of catch and release fishing.</p> <p>Gulf Region has protocols in place on four rivers. The region completed an internal report summarizing the findings of recent studies examining the effects of temperature on catch and release mortality rates and potential sublethal effects. The report will inform potential refinements to warm water protocols in regional rivers.</p> <p>Quebec has protocols in place on two rivers. The temperature threshold was reached on one of them in 2023, therefore a fisheries closure was implemented.</p> <p>*Clarification from the 2023 APR: Maritimes Region does not use warm water protocols on its rivers.</p>
	<p>Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i></p>	<p>Ongoing</p>
	<p>If 'Completed', has the action achieved its objective?</p>	

Action F4:	Description of action <i>(as submitted in the IP)</i>	<p>Monitoring and management of Labrador mixed-stock fishery</p> <p>In order to reduce the interception of non-Labrador origin salmon in the Labrador mixed stock fishery, intervention in the fisheries that are most likely to intercept non-Labrador origin salmon will occur. These interventions include the relocation (time, space) of fishing effort away from areas with known interceptions of non-Labrador origin salmon.</p> <p>There is ongoing work to improve logbook reporting (including date and location of catches) and modified/enhanced sampling of the fishery catches to assess origin of the catches and effectiveness of the management interventions at reducing catches of non-Labrador origin salmon.</p> <p>Since 2019, fishery sample processing has been targeted to areas with higher probability of non-local stock interceptions. Partnerships with Indigenous groups will continue in these sampling activities.</p>
	Expected outcome <i>(as submitted in the IP)</i>	Adaptive management of locations and timing of the fishery based on annual estimates of origin of salmon in the Labrador subsistence fisheries. Effectiveness of management actions will be shown by the absence or reduction over time of harvests of non-Labrador origin salmon.
	Approach for monitoring effectiveness & enforcement <i>(as submitted in the IP)</i>	<p>Three approaches will be used for monitoring progress:</p> <ul style="list-style-type: none"> • Annual sampling of fishery catches conducted by Indigenous groups and DFO, analyses of biological characteristics, and origin of sampled catches using genetic stock identification tools; • Annual reports to ICES and NASCO on catches, biological characteristics, and origin of catches of the Labrador subsistence fisheries; and, • Annual fisheries management consultations with Labrador Indigenous groups to discuss findings of fisheries monitoring and to develop adaptive management approaches for the fishery.
	Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i>	<p>Annually ~850 samples on average are collected from fishery catches in Labrador. Samples include scales for aging and genetic samples for region of origin assignment. Genetic assignment has consistently demonstrated that the majority of salmon harvested in the Labrador fishery are of Labrador origin. These results are provided to the ICES Working Group on North Atlantic Salmon and for reporting to NASCO, and presented as part of stakeholder consultations in Labrador each year.</p> <p>As in 2022, only one U.S.-origin salmon was collected as part of the 2023 samples. No new measures were implemented in 2023 to reduce bycatch of non-Labrador origin salmon. </p>
Current status of action <i>(Please note: 'Completed')</i>	Ongoing	

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	If 'Completed', has the action achieved its objective?	

3.2 Provide an update on progress on actions relating to Habitat Protection and Restoration (section 3.5 of the Implementation Plan).

*Note: the reports under 'Progress on action to date' should provide a **brief overview** of each action. Please report in relation to the reporting year only or the most relevant recent year. For all actions, provide **clear and concise** quantitative information to demonstrate progress. In circumstances where quantitative information cannot be provided for a particular action because of its nature, a clear rationale must be given for not providing quantitative information and other information should be provided to enable progress with that action to be evaluated. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.*

Action H1:	Description of action (as submitted in the IP)	<p>Management of threats related to industrial land-use activities</p> <p>DFO will identify and begin development of additional tools and investments in water quality protection, flow management, and fish passage protection, as well as work with partners, including Indigenous peoples and organizations, to identify priority areas for existing habitat programs.</p> <p>The recently modernized <i>Fisheries Act</i> includes provisions related to fish and fish habitat protection, including:</p> <ul style="list-style-type: none"> • measures relating to authorization and permitting of works, undertakings and activities; • creation of fish habitat banks by a proponent of a project; • establishment of standards and codes of practice; • establishment of a public registry; and, • establishment of ecologically significant areas.
	Expected outcome (as submitted in the IP)	Greater variety of options for regulatory tools and partnerships to reduce the threat to Canada's Atlantic salmon habitat.
	Approach for monitoring effectiveness & enforcement (as submitted in the IP)	DFO is committed to strengthening compliance and effectiveness monitoring to better understand the outcomes of fish and fish habitat protection efforts; as well as improve transparency and openness by providing Canadians with

	<p>Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i></p>	<p>information about DFO’s regulatory activities.</p> <p>In collaboration with stakeholders and partners, Canada made significant progress in modernizing and/or developing tools and investing in projects designed to reduce threats to the habitat of Canada’s Atlantic salmon population in 2023.</p> <p>Progress included:</p> <ul style="list-style-type: none"> • Releasing four interim codes of practice: bridge repair and maintenance; municipal and agricultural drain maintenance; repair and maintenance of in-water structures; and, repair, maintenance and construction of docks, moorings and boathouses; • Releasing an interim standard on in-water site isolation; • Publishing the national Framework to Identify Fish Habitat Restoration Priorities to inform development of regional fish habitat restoration priorities that identify important regional species, areas, and ecosystem functions and define restoration goals. The Framework and the regional restoration priorities aim to improve coordination of marine and freshwater restoration and inform resource management decisions by leveraging partnerships to help reverse habitat loss and degradation; • Publishing the national Framework for the Identification, Establishment and Management of Ecologically Significant Areas (ESAs) to provide clarity on the ESA provisions, details on how to determine conservation and protection objectives and how ESAs could be implemented, guiding principles, and a comparison of ESAs to other conservation tools; • Drafting the Policy for Applying Measures to Offset Harmful Impacts to Fish and Fish Habitat (Offsetting Policy), and the Guidelines for Establishing and Managing Fish Habitat Banks (Banking Guidelines); and • Publishing the Death of Fish and Existing Facilities and Structures position statements. • Funding 45 projects totalling \$75M over 5 years under the Aquatic Ecosystem Restoration Fund. Projects funded through this program help to restore aquatic ecosystems and mitigate human impacts on Canadian coastal and marine environments. • Continuing to support stewardship actions, including removal of barriers and habitat restoration, through the Canada Nature Fund for Aquatic Species at Risk, which aims to build relationships with Indigenous Peoples, provinces and territories, industry, and other partners in advancing protection and recovery of aquatic species at risk, including Atlantic salmon. • Funding the development of a threats-based Watershed Management Plan for the Morrell river in Prince Edward Island. <p>The Freshwater Habitat Initiative Cumulative Effects (FHIN-CE) Working Group advanced understanding of how</p>
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		cumulative effects can be incorporated into decision-making processes.
	Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i>	Ongoing
	If 'Completed', has the action achieved its objective?	
Action H2:	Description of action <i>(as submitted in the IP)</i>	<p>Management of Acid Rain</p> <p>Reduction and elimination of acid rain-causing emissions need to be fully implemented in most areas to mitigate losses of wild Atlantic salmon due to acidification. Some liming of watersheds is being used to buffer acidity, especially in Nova Scotia. The West River Acid Mitigation Project, led by the Nova Scotia Salmon Association (NSSA), commenced in 2005 using liming as a buffering technique. The first decade of this project was funded by the NSSA with recent funding coming from collaboration between the federal and provincial governments and continued funding from the NSSA.</p> <p>The following activities will continue during the 2019-2024 IP cycle:</p> <ol style="list-style-type: none"> 1) Lime dosing using two dosers to directly treat salmon habitat units affected by acid rain; 2) Having completed the first experimental tributary (~180ha of limed land), the helicopter catchment liming project will extend to the next priority tributary of the West River watershed; 3) Physical habitat restoration within the West River is addressing a legacy of log driving and nearby road construction, to increase water depth of coldwater habitat pools; 4) Continued monitoring, including: operation of the adult salmon counting fence; operation of smolt assessment facilities; and, ongoing electrofishing and water chemistry monitoring; 5) Expanding research to include the interplay between forest resiliency/ productivity and catchment liming to integrate salmon and forest economics;

		<p>6) Expanding research on the interplay of acid mitigation of salmon rivers and the potential for carbon sequestration to address national carbon targets with regard to climate change policy; and,</p> <p>7) A regional acid rain mitigation strategy is being developed based on the experience of the West River project. This strategy will identify priority sites for future acid mitigation strategies based on updated water chemistry and salmon resource data (eDNA) and other considerations.</p>
	<p>Expected outcome (as submitted in the IP)</p>	<p>The liming project in West River has had very positive results. Parr numbers have increased by more than 300 per cent and new sections of the river are being recolonized. Liming can be fairly expensive and must be done repeatedly as long as the source of acidity remains.</p>
	<p>Approach for monitoring effectiveness & enforcement (as submitted in the IP)</p>	<p>Parr numbers will continue to be monitored in limed areas to assess the continued effectiveness of these efforts.</p> <p>Additionally, adult salmon will be measured by a counting fence. Raised awareness of the restoration project by DFO and Provincial enforcement will target known by-catch or poaching areas.</p>
	<p>Progress on action to date (Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</p>	<p>Reporting for 2023 is provided for each of the seven elements of the action described above.</p> <ol style="list-style-type: none"> 1. Lime continued to be supplied to both dosers, partially funded by the Nova Scotia Sportfish Habitat Fund, the Canada Nature Fund for Aquatic Species at Risk, and the Aquatic Ecosystem Restoration Fund. The year 2023 resulted in 2,106 metric tonnes of lime utilized by the dosers from 2022 through 2023. Significant modifications and improvements were made in the delivery/operating systems and automation of the doser equipment during this period. 2. Completed in 2022. 3. Habitat restoration involved installing structures to narrow and deepen the main stem of the West River. Engineered coldwater refugia, an experimental innovation, were installed at two sites on the Killag River of West River for coldwater refugia enhancement. 4. The NSSA operates a rotary screw trap to conduct annual smolt estimates, which was deployed between April 25, 2023 and May 17, 2023. Low flow conditions limited operations, which meant a reliable estimate was not possible. However, 23 of the 207 smolts captured were tagged as part of the Environmental Studies Research Fund - Atlantic Salmon Project, Migration of Salmon at Sea. Fall redd surveys also continue to be conducted for long term monitoring.

		<p>5. A MSc project was completed regarding the initial response of forests to catchment liming, including an economic assessment of the return-on-investment for catchment liming specifically, focused on forestry products. The MSc and manuscript are in preparation.</p> <p>6. The Carbon Run research, founded and developed in Nova Scotia by an environmental scientist and freshwater ecologists, is ongoing. The goal is to restore the health of rivers and their natural ability to draw carbon from land-to-ocean through targeting liming.</p> <p>7. The NSSA has identified eight priority watersheds and developed geospatial plans to guide restoration efforts to help improve the quality of aquatic habitat, with focus on species at risk. Watershed plans were developed across the southeastern shore of Nova Scotia (Southern Uplands), and five watersheds in the Southern Gulf of St. Lawrence. These plans are developed from sampled and collated multi-parameter data using modelling and weighted scoring to identify restoration priorities and guide the most impactful use of conservation efforts. A weighted scoring model was applied to identify where acid rain mitigation could be expected to achieve targeted pH for salmonids and where in each this corresponded with other habitat requirements such as gradient and thermal conditions and habitat accessibility (aquatic connectivity). Across the Southern Uplands acid mitigation rank as the most impactful restoration action for Atlantic salmon.</p>
	<p>Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i></p>	<p>Ongoing</p>
	<p>If 'Completed', has the action achieved its objective?</p>	<p> </p>
<p>Action H3:</p>	<p>Description of action <i>(as submitted in the IP)</i></p>	<p>Management of Aquatic Invasive Species (AIS)</p> <p>In New Brunswick, since 2008, DFO and NGO partners have used physical control methods to contain and reduce Smallmouth bass in Miramichi Lake. A 2018 review of this program indicated that there was evidence of depletion of Smallmouth bass in Miramichi Lake but the extent of the reduction could not be quantified. Given that an eradication program, using rotenone, had been proposed for some time, in</p>

		<p>2021 federal and provincial regulatory approval was given to a stakeholder consortium to apply rotenone in Miramichi Lake and the immediate downstream river sections where Smallmouth bass were detected. Although planned for the fall of 2021 the rotenone project has been postponed to 2022.</p> <p>In Nova Scotia, the Province and DFO have collaborated to undertake targeted physical removals of Smallmouth bass and Chain pickerel on selected rivers. In 2020, the Province applied rotenone to Piper Lake to eradicate Smallmouth bass from the headwaters of the St. Mary's River.</p>
	<p>Expected outcome <i>(as submitted in the IP)</i></p>	<p>The invasive species in Piper Lake, Nova Scotia, is expected to be eliminated.</p> <p>Smallmouth bass in the headwaters of the Miramichi River are expected to be eradicated in 2022. t</p>
	<p>Approach for monitoring effectiveness & enforcement <i>(as submitted in the IP)</i></p>	<p>In the Miramichi River, the annual surveillance for the presence of Smallmouth bass will continue using eDNA methods and during regular fish population monitoring primarily through electrofishing and long-term trap-net stations.</p> <p>In Piper Lake, gillnetting and electrofishing will be undertaken to monitor whether any Smallmouth bass remain.</p>
	<p>Progress on action to date <i>(Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</i></p>	<p>In 2023, following protests and opposition to the project, the proponent of the smallmouth bass eradication project in the headwaters of the Miramichi River notified government regulatory agencies that it no longer wanted to proceed with the project. DFO continued to monitor the spread of smallmouth bass throughout the Miramichi watershed using environmental DNA (eDNA). eDNA results and confirmed catches indicate that smallmouth bass have established a presence in the Southwest Miramichi River.</p> <p>In Piper Lake, gillnetting and electrofishing was conducted, and confirmed that no smallmouth bass remained. Also, no smallmouth bass within the St. Mary's River watershed have been reported. Although Atlantic salmon do not utilize Piper Lake, eradication of smallmouth bass ensured colonization in hundreds of lakes and important riverine habitat downstream did not occur. Sampling in 2023 determined that the majority of native species present before treatment have recolonized except for yellow perch. Brook trout, not present before treatment, were detected.</p>
	<p>Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it</i></p>	<p>Completed</p>

	<i>should be marked as 'Ongoing')</i>	
	If 'Completed', has the action achieved its objective?	[No for the Miramichi River eradication project. Yes for the Piper Lake eradication project.]
<p>3.3 Provide an update on progress on actions relating to Aquaculture, Introductions and Transgenics (section 4.11 of the Implementation Plan).</p> <p><i>Note: the reports under 'Progress on action to date' should provide a brief overview of each action. Please report in relation to the reporting year only or the most relevant recent year. For all actions, provide clear and concise quantitative information to demonstrate progress. In circumstances where quantitative information cannot be provided for a particular action because of its nature, a clear rationale must be given for not providing quantitative information and other information should be provided to enable progress with that action to be evaluated. While referring to additional material (e.g. via links to websites) may assist those seeking more detailed information, this will not be evaluated by the Review Group.</i></p>		
Action A1:	Description of action (as submitted in the IP)	<p>Research to support assessment of potential impacts of sea lice from farmed fish on wild Atlantic salmon stocks and mitigation measures</p> <p>Ongoing efforts aim to determine the potential impacts of sea lice from farms to wild Atlantic salmon populations. This includes research on sea lice tolerance to various environmental conditions, virulence of sea lice, impacts of co-infections and potential mitigation measures of sea lice on farms. The results of these efforts may inform, as appropriate, any potential new legislative or regulatory approaches to manage sea lice on salmon farms and impacts on wild salmon.</p>
	Expected outcome (as submitted in the IP)	Improved understanding of the potential impacts of sea lice from farms to wild Atlantic salmon populations and recommendations for effective mitigation measures, if applicable.
	Approach for monitoring effectiveness & enforcement (as submitted in the IP)	The results of this and other research will be published in peer-reviewed journals and other publications.
	Progress on action to date (Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)	<p>Federally funded research to support the assessment of potential impacts of sea lice from farmed fish on wild Atlantic salmon stocks and mitigation measures is ongoing. This includes funding for several ongoing, multi-year research projects in 2023 that focused on:</p> <ol style="list-style-type: none"> 1. Evaluating sea lice diversity, abundance, and connectivity. 2. Studying sea lice-resistant farmed Atlantic salmon to learn how they respond to sea lice attachment, which genes are involved in their response, and how selection for sea lice resistance works at the production level. 3. Exploring probiotic treatment options to reduce sea lice infestations. <p>Additionally:</p>

		<p>1. NL Region has deployed sentinel cages in a field trial to hold wild fish near farms to determine infectability. A second year of baseline plankton monitoring in both no (control) and active areas of salmon farming was conducted.</p> <p>2. Research continues to determine the impact of sea lice on farmed Atlantic salmon to wild salmon population on the west coast. This work will enhance current understanding and potentially inform future similar work on the east coast.</p>
	<p>Current status of action (Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</p>	Ongoing
	<p>If 'Completed', has the action achieved its objective?</p>	
Action A2:	<p>Description of action (as submitted in the IP)</p>	<p>Research to support assessment of genetic introgression and mitigation measures.</p> <p>Federally-funded research is ongoing to quantify hybridization and introgression of farmed and wild Atlantic salmon in Atlantic Canada using genomic tools. The results of this research may inform, as appropriate, any potential new legislative or regulatory approaches for the management of containment and the impacts of escapement.</p>
	<p>Expected outcome (as submitted in the IP)</p>	<p>Improved understanding of the consequences of introgression for wild populations in Atlantic Canada and recommendations for effective mitigation measures, if applicable.</p>
	<p>Approach for monitoring effectiveness & enforcement (as submitted in the IP)</p>	<p>The results of this and other research will be published in peer-reviewed journals and other publications.</p>
	<p>Progress on action to date (Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g.</p>	<p>Federally funded research to support assessment of genetic introgression and mitigation measures is ongoing. This includes funding for several ongoing and new multi-year research projects in 2023 that focused on:</p> <p>1. Using genomic tools to improve our understanding of the extent of aquaculture-originated Atlantic salmon introgression in endangered Atlantic Salmon populations, which are currently supported by the Live Gene Bank.</p>

	<p><i>website links) will not be evaluated)</i></p>	<p>2. Improving understanding of hybridization and introgression of wild and escaped farmed Atlantic salmon, including potential consequences to wild Atlantic salmon populations.</p> <p>Canada also collaborated with international experts, academia, provincial governments and Indigenous experts to complete a semi-quantitative risk assessment on the risk posed to wild Atlantic Salmon population abundance and genetic character by direct genetic interaction with escapes from East Coast Atlantic Salmon aquaculture. A Canadian Science Advisory Secretariat Science Advisory Report has been published, which includes a summary of the risk assessment and outlines mitigation options for reducing the risk of direct genetic interactions between farm escapees and wild Atlantic Salmon populations.</p> <p>Experimental studies have also evaluated the survival, behaviour, and growth of wild, farmed and hybrid offspring both in the lab and in the wild in southern Newfoundland. Results have been summarized in a series of journal publications.</p>
	<p>Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i></p>	<p>Ongoing</p>
	<p>If 'Completed', has the action achieved its objective?</p>	<p></p>
<p>Action A3:</p>	<p>Description of action <i>(as submitted in the IP)</i></p>	<p>Research with respect to wild and farmed fish health and emerging diseases</p> <p>Fish health research contributes to the Government of Canada's ability to identify and address threats to wild fish and ecosystem health.</p> <p>Ongoing fish health research on the east coast of Canada includes studies of:</p> <ul style="list-style-type: none"> • impacts on wild Atlantic salmon of the transmission of Infectious Salmon Anaemia virus (ISAv) originating from Atlantic salmon farms in Atlantic Canada; • disease transfer potential between wild fish and salmon farms;

		<ul style="list-style-type: none"> • Piscine orthoreovirus (PRV) susceptibility of Atlantic salmon; and • virulence of <i>Renibacterium salmoninarum</i> in New Brunswick. <p>Additionally, a federal Emerging Disease Evaluation Committee was established by the Canada Food Inspection Agency – the lead federal regulatory authority for aquatic animal health – and DFO to identify, evaluate, report, and recommend potential management actions of emerging infectious disease of wild and cultured aquatic animals.</p>
	<p>Expected outcome (as submitted in the IP)</p>	<p>Efforts related to fish health are expected to provide improved scientific advice for the management of risks related to disease associated with wild-farmed salmon interactions in Atlantic Canada, and may inform, as appropriate, any potential new legislative or regulatory approaches to mitigate disease impacts on wild fish.</p> <p>The joint CFIA-DFO Committee is expected to improve the process of understanding and evaluating potential emerging diseases of wild and cultured aquatic animals. The committee will improve interdepartmental communication and enable a coordinated federal response.</p>
	<p>Approach for monitoring effectiveness & enforcement (as submitted in the IP)</p>	<p>The results of this and other research will be published in peer-reviewed journals and other publications.</p> <p>A review of the policy governing the emerging disease committee is conducted every five years.</p>
	<p>Progress on action to date (Provide a brief overview with a quantitative measure, or other justified evaluation, of progress. If sub-actions are completed during the reporting year, this should be made clear. Other material (e.g. website links) will not be evaluated)</p>	<p>Federally funded research with respect to wild and farmed fish health and emerging diseases is ongoing. This includes funding for several ongoing multi-year research projects in 2023 that focused on:</p> <ol style="list-style-type: none"> 1. Improving understanding of the survival and stability of ISAV outside the host, prevalence of non-pathogenic strain on farms and risk of its evolution to pathogenic strain, dispersal of ISAV particles, and exposure of wild Atlantic salmon during ISAV outbreaks on salmon farms. 2. Evaluating the associations and movements of wild fish between and around Atlantic salmon farms in southwest New Brunswick to determine the disease transfer potential. 3. Filling knowledge gaps related to <i>Renibacterium salmoninarum</i>, including its assessment and management, current status, and associated risks in its control in Atlantic Canada. <p>There was no ongoing PRV-related work on the east coast in 2023.</p>

		The federal Emerging Disease Evaluation Committee continued to meet regularly. Activities for 2023 focused on identifying and evaluating aquatic emerging diseases.
	Current status of action <i>(Please note: 'Completed' means that the overall action is complete for the lifetime of the third reporting cycle. If it is an ongoing action that is reported on annually, it should be marked as 'Ongoing')</i>	Ongoing
	If 'Completed', has the action achieved its objective?	
4: Additional information required under the Convention		
4.1 Details of any laws, regulations and programmes that have been adopted or repealed since the last notification.		
<p>In 2023, a comprehensive review of Nova Scotia's aquaculture regulations was completed. Nova Scotia is working to implement the recommendations of this review.</p> <p>The New Brunswick Department of Agriculture Aquaculture and Fisheries launched a Public Aquaculture Registry in the fall of 2023. The Aquaculture Registry shares information with the public on aquaculture authorizations, aquatic animal health and reportable conditions including escape of finfish or failure of containment structures.</p> <p>The Newfoundland and Labrador Aquaculture Act was assented to on November 16, 2023, but it has not yet been proclaimed. Once it is proclaimed, it will become fully effective and enforceable.</p>		
4.2 Details of any new commitments concerning the adoption or maintenance in force for specified periods of time of conservation, restoration, and other management measures.		
Nil		
4.3 Details of any new actions to prohibit fishing for salmon beyond 12 nautical miles.		
Nil		
4.4 Details of any new actions to invite the attention of States not party to the Convention to matters relating to the activities of its vessels which could adversely affect salmon stocks subject to the Convention.		
Nil		
4.5 Details of any actions taken to implement regulatory measures under Article 13 of the Convention including imposition of adequate penalties for violations.		
Nil		
North American Commission Members only:		
4.6 Details of any new measures to minimise bycatches of salmon originating in the rivers of the other member.		
Nil		

4.7 Details of any alteration to fishing patterns that result in the initiation of fishing or increase in catches of salmon originating in the rivers of another Party except with the consent of the latter.

Nil