IP(19)17rev

NASCO Implementation Plan for the period 2019-2024

Canada

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The main purpose of this Implementation Plan is to demonstrate what actions are being taken by the Parties / jurisdictions to implement NASCO's Resolutions, Agreements and Guidelines.

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

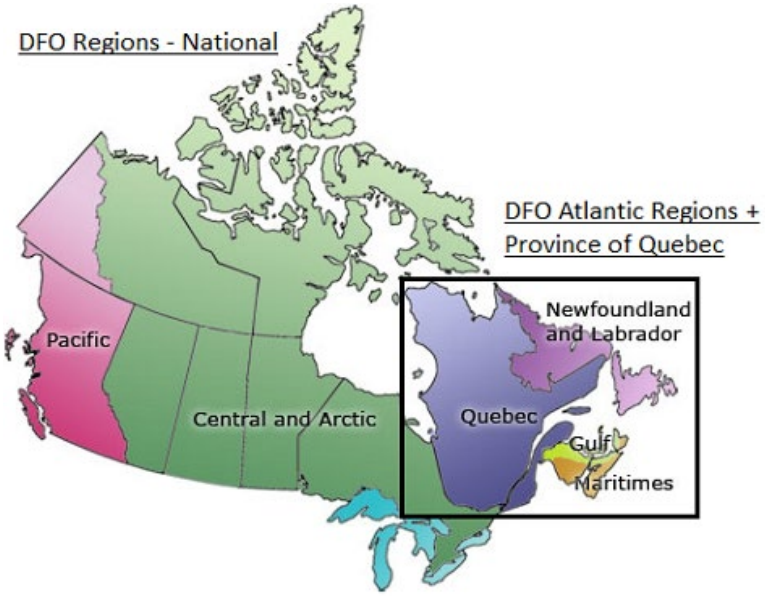
Questions in the Implementation Plan are drawn from the following documents:

- *NASCO Guidelines for Management of Salmon Fisheries, CNL(09)43 (referred to as the 'Fisheries Guidelines');*
- *Report of the Working Group on Stock Classification, CNL(16)11;*
- *Minimum Standard for Catch Statistics, CNL(93)51 (referred to as the 'Minimum Standard');*
- *Revised matrix for the application of the six tenets for effective management of an Atlantic salmon fishery, WGCST(16)16[1];*
- *NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat, CNL(01)51;*
- *NASCO Guidelines for Protection, Restoration and Enhancement of Atlantic Salmon Habitat, CNL(10)51 (referred to as the 'Habitat Guidelines');*
- *Williamsburg Resolution, CNL(06)48;*
- *Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks (SLG(09)5) (referred to as the 'BMP Guidance');*
- *Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach (CNL(04)57); and*
- *Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of G. salaris and eradicate it if introduced', NEA(18)08.*

Party:	**Canada**
Jurisdiction / Region:	Fisheries and Oceans Canada (DFO) is the federal administrative body responsible for the management of Atlantic salmon fisheries and habitat, with the exception of Province of Quebec, which bears this responsibility in its jurisdiction. All provinces, though, are granted exclusive jurisdiction over matters dealing with property, civil rights, the management of public lands and inland waters under Canada's *Constitution Act.* In Atlantic Canada, DFO has three

[1] This document can be obtained from the NASCO Secretariat; email hq@nasco.int

Regions referred to throughout this Implementation Plan (IPM): Gulf, Maritimes, Newfoundland and Labrador:



Provincial jurisdictions referred to in the IP include Quebec as well those in Atlantic Canada (New Brunswick, Newfoundland and Labrador; Nova Scotia; and, Prince Edward Island).

1. Introduction

1.1 What are the objectives for the management of wild salmon? *(Max 200 words)*

The Government of Canada recognizes that wild Atlantic salmon is an important icon for Canadians. It is fished for food, social, and ceremonial (FSC) purposes by more than forty First Nations and many Indigenous communities. In central and coastal Labrador, it is relied on for local community food fisheries. Salmon angling is also a valued recreational activity by both local residents and non-residents. Wild Atlantic salmon are also considered an indicator of environmental quality, an animal of respect, an attraction for eco-tourism and have an importance beyond economic returns.

Canada's national goals and objectives are to restore and maintain healthy wild Atlantic salmon populations. This will be achieved by rebuilding and protecting the biological foundations of wild Atlantic salmon while taking into consideration the social, cultural, ecological and economic benefits of wild salmon for now and for future generations of Canadians. Closely associated with these goals and resulting management actions is an enhanced understanding of all drivers affecting Atlantic salmon populations, such as climate change.

1.2 What reference points (e.g. conservation limits, management targets or other measures of abundance) are used to assess the status of stocks? *(Max 200 words)*

(Reference: Sections 2.4 and 2.5 of the Fisheries Guidelines)

Limit Reference Point (LRPs) have been defined and published for Atlantic salmon rivers in eastern Canada. Upper stock reference points (URPs), have been defined for salmon rivers in the Province of Quebec and for the rivers of Newfoundland and Labrador. The development of URPs in the Gulf Region is ongoing and is expected to be completed by 2020. Where adult assessments are not available, other indicators of abundance, including fisheries harvests and catches, indices of catch per unit effort, indices of juvenile abundance, and trends in these indices are used to infer stock status.

Populations of Atlantic salmon can also be assessed by the Committee on the Status of Wildlife in Canada (COSEWIC), and listed under the *Species at Risk Act* (SARA), federal legislation designed to protect extirpated, endangered or threatened species and their habitats in Canada, as well as provide for the management of species of special concern. COSEWIC defined sixteen Designatable Units (DUs) of Atlantic salmon in eastern Canada and assessed their status as to the level of risk of extirpation. Six DUs were assessed as Threatened or Endangered, and Recovery Potential Assessments were completed for all of these. The inner Bay of Fundy (iBoF) population of Atlantic Salmon is the only population legally listed as Endangered under SARA (since 2003) and recovery planning is well underway.

1.3 What is the current status of stocks under the new classification system outlined in CNL(16)11?

Stock Classification Score	Salmon Classification Category	Number of rivers
0	Not at Risk	22
1	Low Risk	74
2	Moderate Risk	40
3	High Risk	99
N/A	Artificially Sustained	7
N/A	Lost	105
N/A	Unknown	510

Additional comments:

The NASCO Atlantic salmon rivers database was reviewed and revised in 2018. A technical report describing the information used to populate the database and to ascribe a classification according to NASCO CNL(16)11 is to be published. Specific information on adult abundance and impacts was used when available. Detailed information was not available for all of the over 1000 rivers in eastern Canada. In the absence of detailed information, regional information, at the scale of salmon fishing areas was used to classify the status of salmon rivers. The geographic isolation of many rivers in eastern Canada, particularly in the northern areas of the country, preclude the development of quantitative metrics. In a similar way, these geographically isolated rivers are generally subjected to low direct anthropogenic impacts.

1.4 How is stock diversity (e.g. genetics, age composition, run-timing, etc.) taken into account in the management of salmon stocks? *(Max 200 words)*

The majority of directed fisheries for Atlantic salmon occur in rivers and/or estuaries, generally harvesting single river populations. The Labrador food fisheries capture salmon from a large number rivers; genetic stock identification of the catches indicates that the majority (>98%) of the salmon originate from the rivers of Labrador. Management measures to limit effort to estuaries and inner bays are designed to reduce interceptions of non-local populations of salmon.

Large salmon (>= 63 cm fork length; multi-sea-winter salmon) are the majority egg-bearing females, and restrictions on the retention of large salmon in directed fisheries including recreational fisheries have been in place since 1984. In some Indigenous peoples food, social and ceremonial fisheries, fishing gears such as trap nets that allow the selective harvesting of small salmon over large salmon have been promoted.

Run-timing is not a concern because salmon generally return to rivers in eastern Canada from late May to late October and there are no spring salmon runs.

1.5 To provide a baseline for future comparison, what is the current and potential quantity of salmon habitat? *(Max 200 words)*
(Reference: Section 3.1 of the Habitat Guidelines)

The information provided in the NASCO Rivers database provides a baseline of the current quantity of salmon freshwater habitat; where available, estimates of freshwater fluvial habitat areas, and for Newfoundland lacustrine habitat, are provided. Watershed areas (km²) are provided for 768 of 857 rivers in the database (90%). Estimates of fluvial habitat equivalents are provided for 520 rivers in eastern Canada; the fluvial habitat equivalents total 574 million m². Most rivers for which fluvial habitat has not been quantified are in the northern areas of Labrador and portions of Newfoundland and many of which are isolated rivers subjected to low direct anthropogenic impacts. For DFO Maritimes Region, detailed information on habitat quantity, access, and quality are provided in the recovery potential assessment reports and/or the recovery plans for the populations at risk of extirpation.

1.6 What is the current extent of freshwater and marine salmonid aquaculture?

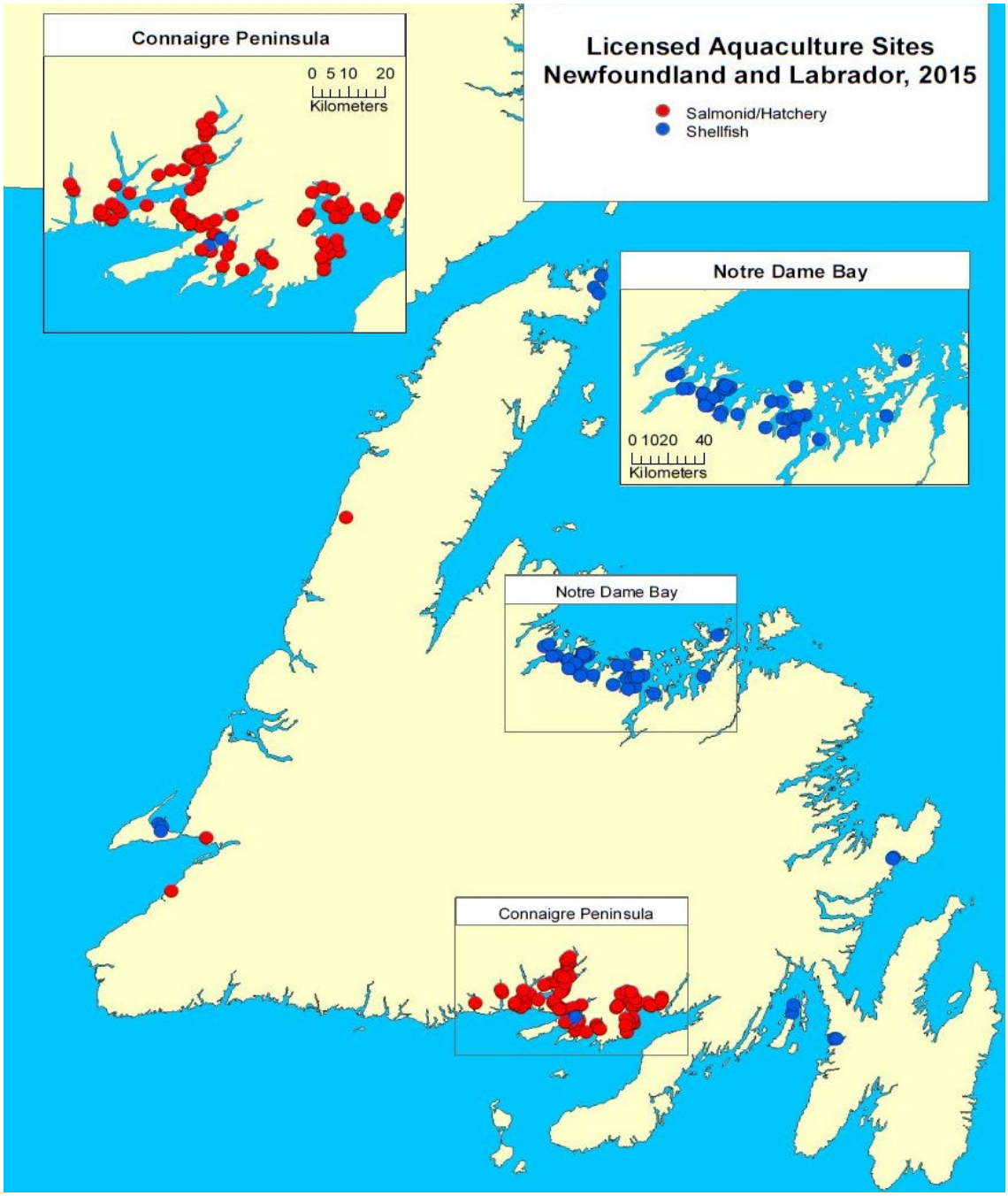
Number of marine farms	As of 2018 in Atlantic Canada, there were 151 marine finfish sites.
Marine production (tonnes)	In 2017, production was 53,767 tonnes.
Number of freshwater facilities	In 2018, there are 6 freshwater cage sites and 116 land-based facilities in Atlantic Canada. This includes hatcheries, enhancement facilities, scientific research facilities, and grow-out operations. Many of these facilities are also farming multiple species and are not just limited to salmonid

	species.
Freshwater production (tonnes)	In 2017, there was 464 tonnes of freshwater production.

Maps showing the location of aquaculture facilities and aquaculture free zones in rivers and the sea:

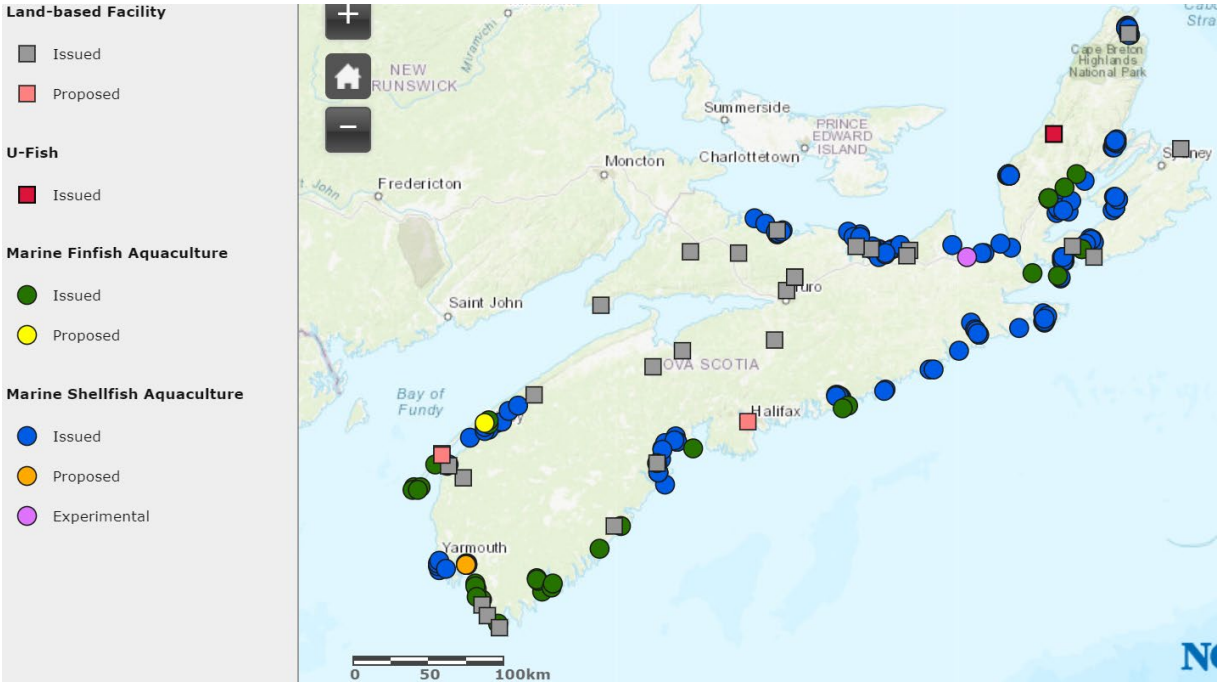
1. New Brunswick - Marine Aquaculture Site Mapping Program (For a more detailed and interactive view, use the following tool:):
   https://www2.gnb.ca/content/gnb/en/departments/10/aquaculture/content/masmp.html

2. Newfoundland and Labrador:



https://www.fishaq.gov.nl.ca/pdf/aquaculture_2015_year.pdf (2015)

3.Nova Scotia:



Screenshot of high level overview. For a more detailed and interactive view, use the following tool: https://novascotia.ca/fish/aquaculture/site-mapping-tool/

1.7 Please describe the process used to consult NGOs and other stakeholders and industries in the development of this Implementation Plan. *(Max 200 words)*

DFO's primary consultative body for issues related to wild Atlantic salmon is the Atlantic Salmon Advisory Committee (ASAC). The ASAC consists of nearly 40 member organizations, each representing a variety of Indigenous groups, provincial and territorial governments, watershed and conservation groups, and umbrella organization such as the Atlantic Salmon Federation. DFO has been consulting with the members of the ASAC extensively over the past several years, particularly since 2014, which saw historically low returns of salmon in eastern Canada. This engagement has touched upon many of the issues and actions in this document, including through the revision of Canada's *Wild Atlantic Salmon Conservation Policy.* Most consultations are done via teleconference but ASAC also meets in-person on a bi-annual basis.

For the purposes of this Implementation Plan, members of ASAC were engaged via teleconferences and written comments were also sought. The content of this document was informed by this process and the perspectives of the stakeholders were incorporated as appropriate.

2. Management of Salmon Fisheries:

In this section please review the management approach to each of the fisheries in your jurisdiction (i.e. commercial, recreational and other fisheries) in line with the relevant NASCO Resolutions, Agreements and Guidelines. For Parties / jurisdictions that prosecute mixed-stock fisheries, there should at least one action related to their management.

2.1 What are the objectives for the management of the fisheries for wild salmon? *(Max. 200 words)*

The primary objective is that conservation remains the first principle that all decisions are based on, utilizing strategies that promote sustainability, the principles of the precautionary approach (PA) and shared stewardship. Four objectives are outlined in Canada's *Wild Atlantic Salmon Conservation Policy* as follows:

1. Conservation: *The conservation of wild Atlantic salmon populations, their genetic diversity and their habitats must be given the highest priority in management decisions;*
2. Sustainable Use and Benefits: *Management decisions must respect the rights of Indigenous peoples, reflect best available science, and consider local and Indigenous traditional knowledge as well as the biological, social and economic consequences for Canadians;*
3. Precautionary Approach and Transparent Decision Making: *Management decisions must apply the precautionary approach and must be made in an open, inclusive, and transparent manner;*
4. Shared Stewardship: *Conservation initiatives will be optimized with the active engagement of provincial governments, First Nations, other Indigenous organizations, volunteers and other stakeholders in the development and implementation of management decisions.*

For SARA-listed populations, management decisions should be consistent with the requirements of the Species at Risk Act (i.e. in compliance with the prohibitions of the act and consistent with the objectives for survival and recovery).

2.2 What is the decision-making process for the management of salmon fisheries, including predetermined decisions taken under different stock conditions (e.g. the stock levels at which regulations are triggered)? *(Max. 200 words)*

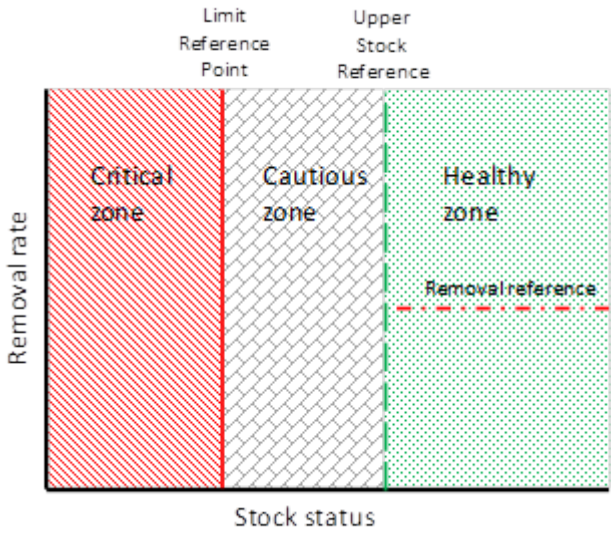
(This can be answered by providing a flow diagram if this is available.)
(Reference: Sections 2.1 and 2.7 of the Fisheries Guidelines)

In Canada, the priority right of access to Atlantic salmon is: conservation, Indigenous Peoples Food, Social and Ceremonial Fisheries (FSC), recreational fisheries, and commercial fisheries. Conservation is defined within the Precautionary Approach (PA) Framework and harvesting decisions are determined based on the status of Atlantic salmon relative to river-specific reference points. The river-specific references points account for freshwater habitat areas of individual rivers and the variations in life history characteristics of adult salmon.

No retention of large salmon is allowed in recreational fisheries unless status is above the Upper Stock Reference (USR) point of the PA Framework. In the cautious zone of the PA, recreational fisheries are restricted to retention of small salmon only, with area or river quotas or bag limits per licence based on status within that zone. When the stock status is in the Critical zone, below the Limit Reference Point (LRP), reductions in Indigenous peoples fisheries are negotiated, recreational fisheries retention of small salmon is severely curtailed or prohibited but catch and release fishing may be permitted. When stock status falls to a state where the population is considered to be threatened or endangered, all fisheries for salmon can be prohibited. Decisions regarding access are

guided by input from stakeholders, partners and Indigenous groups, and consider cultural and socio economic factors.

For the Inner Bay of Fundy population group which is listed under Schedule 1 of the Species at Risk Act, prohibitions on harm to fish or fish habitat apply.



Standard Precautionary Approach diagram showing the three status zones and the reference points which delimit the zones.

2.3 (a) Are any fisheries permitted to operate on salmon stocks that are below their reference point (e.g. Conservation Limits)? If so, (b) how many such fisheries are there and (c) what approach is taken to managing them that still promotes stock rebuilding? *(Max 200 words)*
(Reference: Section 2.7 of the Fisheries Guidelines)

A) Yes. A number of Indigenous FSC fisheries and recreational fisheries are permitted on stocks that are below their LRPs.

b)

Region	Indigenous fisheries	Recreational fisheries
DFO Maritimes Region	FSC allocations on three rivers are mostly unharvested in accordance with the provisions of the Mi'kmaq Atlantic Salmon, Plamu, Conservation Harvest Plan which discourages harvesting on rivers not meeting the LRP.	All rivers are closed to salmon angling except for catch and release permitted during cold water periods on three rivers with Indigenous access.
DFO Gulf Region	In some years, this may occur in the Northwest Miramichi River and the Restigouche River.	Catch and release only since 2015 on all rivers that are open to salmon fishing.
Quebec	No indigenous fisheries are permitted to operate on salmon stocks that are below their LRP. Such fisheries nevertheless occurred some years in one or two rivers.	In 2018, angling was allowed on 16 rivers for which it is established or suspected that the salmon population is below its LRP. For 8 of them, there was no retention of large salmon and only a restricted number of small salmon could be

		harvested. For the other 8 rivers, catch and release of all salmon was mandatory.
Newfoundland	No FSC allocations for insular Newfoundland.	Retention limits of grilse significantly reduced and no retention of large salmon. In 2018, there were fifteen monitored rivers on the island of Newfoundland, of which nine were below the LRP. Status varies annually.
Labrador	Subsistence fisheries from salmon stocks of varying status	Retention limits of grilse significantly reduced and no retention of large salmon. Of four monitored rivers in Labrador in 2018, three rivers were below the LRP. Status varies annually.

c) Stock rebuilding is favoured by reducing exploitation on and fisheries related losses of egg-bearing female salmon.

For salmon populations below the LRP, fisheries are allowed if the loss of egg bearing females can be minimized; for example in FSC fisheries using selective fishing gear that targets small salmon that are majority males, in recreational fisheries with gear, area and season restrictions to minimize the mortality from catch and release fishing, including closures during warm and low water periods.

In Québec, fisheries on stocks below their LRP are all characterised by the mandatory release of large salmon. Retention of small salmon is only allowed if less than 30% of the total egg deposition is from those small salmon and if an organization with an official agreement with the government ensure protection against poaching and provide reliable catch data.

Implementation of in-season reviews on some stocks that inform management measures including retention limits. A few rivers have special management plans to allow angling on stocks that have historically not achieved their LRPs, most are associated with stocks that are rebuilding following access to new freshwater habitat.

2.4 (a) Are there any mixed-stock salmon fisheries? If so (b) how are these defined, (c) what was the mean catch in these fisheries in the last five years and (d) how are they managed to ensure that all the contributing stocks are meeting their conservation objectives? *(Max. 300 words in total)*
(Reference: Section 2.8 of the Fisheries Guidelines)

(a) Yes

(b) As per NASCO definition, a salmon stock is defined on the basis of a river entering tidal waters. The Labrador Indigenous FSC fisheries, and subsistence trout fishery, as by-catch of salmon, take place in estuaries and coastal areas and are considered to be mixed stock fisheries.

(c) The average harvest in the Labrador subsistence fisheries for the last five years (2013 to 2017) has been 38.9 t, comprising 15.6 t of small salmon and 26.3 t of large salmon. This harvest level represents on average about 13,600 salmon; 7,900 small salmon and 5,700 large salmon. Reported harvest in 2018 was 33.1 t, by number 8,400 small salmon and 4,100 large salmon.

(d) Annual sampling of the Labrador subsistence fisheries catches provides biological data and tissues for genetic stock identification. Genetic analyses for 2006-2016 indicate that the large majority (96%) of the samples originated from the Labrador Central regional group, with occasional interceptions of salmon from outside the Labrador area, such as from the Gulf of St. Lawrence and USA rivers.

Fishing season and mesh sizes have been modified to reduce the capture of large, multi-sea winter salmon, while providing an opportunity to harvest small salmon, trout and char. While the net fisheries are authorized for coastal waters, fishing activity occurs very close to the communities, which are located in deep bays along the coast away from the headlands where interception could be an issue. All FSC fisheries are controlled through the issuance of a communal licence by DFO.

Management measures include:

- prohibition on the use of mono filament netting;
- maximum net length of 25 fathoms and nets set in a straight line;
- gear must be attended every 24 hours and a closure during weekends (nets taken up);
- all fish must be tagged; and,
- a completed logbook with catch and location of fishing must be submitted by end of season.

2.5 How are socio-economic factors taken into account in making decisions on management of salmon fisheries? *(Max. 200 words)*
(Reference: Section 2.9 of the Fisheries Guidelines)

All decision making is guided foremost by the principle of conservation of wild salmon populations, which requires that their genetic diversity and their habitat are given the highest priority in all management decisions, utilizing the precautionary approach. Decisions must also respect the rights of Indigenous peoples to priority access for FSC purposes, reflect the best available science, and consider local and Indigenous traditional knowledge as well as the biological, social, and economic consequences for Canadians, aiming to provide the widest range of uses and benefits possible. Consultations are held with Indigenous groups and all implicated stakeholders to ensure that the impacts of decisions being made are well understood.

2.6 What is the current level of unreported catch and what measures are being taken to reduce this? *(Max. 200 words)*
(Reference: Section 2.2 of the Fisheries Guidelines and the Minimum Standard)

Estimates of unreported catch for eastern Canada ranged between 21 t and 28 t during 2013 to 2017 (24 t in 2018), substantially less than the estimates ranging from 111 t to 284 t prior to the commercial salmon fishery moratorium in Newfoundland and Labrador in 1992.

Measures to reduce the level of unreported catch in legal directed salmon fisheries include improving the reporting of harvests through the use of logbooks, logbook reminders to anglers at the end of the season and compliance monitoring. Participation in educational opportunities with stakeholders and the use of social and local media to educate the public on the importance of reporting. Management

measures are used to reduce the potential for bycatch and illegal retention in other fisheries, including prohibitions on the use of monofilament mesh in pelagic gillnets during peak periods of Atlantic salmon runs, restrictions on mesh size, sinking of head ropes on fixed gear sets, and restrictions on bait fisheries during peak migration periods of salmon, requirements to report all bycatch in commercial fisheries.

The courts have imposed substantial fines and forfeitures of catch, vehicles, boats etc. and often issue prohibitions against future fishing. This acts as a deterrent to not reporting or under-reporting landings in these fisheries.

2.7 Has an assessment under the Six Tenets for Effective Management of an Atlantic Salmon Fishery been conducted? If so, (a) has the assessment been made available to the Secretariat and (b) what actions are planned to improve the monitoring and control of the fishery? (c) If the six tenets have not been applied, what is the timescale for doing so? *(Max. 200 words)*
(Reference: Six Tenets for Effective Management of an Atlantic Salmon Fishery, WGCST(16)16)

(a) Yes, Canada's assessment has been conducted and submitted to the Secretariat.

(b) *Newfoundland and Labrador*: An educational project aimed at improving the quantity and quality of FSC fishery logbook returns.

The development of an angling mobile application to record fishing location, as well as catch and effort. Reminders to report (sent 3 times between October and January), advertising in local recreational fisher magazines, and the use of social media. A local conservation group has been approached to conduct a follow-up phone survey, and offer an incentive of a prize draw for anglers who send in their information stub.

Maritimes and Gulf: The Province of Nova Scotia intends to replace the current paper licencing system with an electronic licence system as early as 2020. This will provide real time information on the number of licences issued, provide for on-line reporting of catch and more efficiently track and notify anglers with delinquent catch reports. New Brunswick currently has an online catch reporting and is undertaking various approaches to increase their information returns.

Quebec: Awareness campaigns to promote the reporting of salmon that were caught and released will continue. Funding has been secured to improve the monitoring of subsistence fisheries.

(c) N/A

2.8 Identify the threats to wild salmon and challenges for management associated with their exploitation in fisheries, including bycatch of salmon in fisheries targeting other species.

Threat / challenge F1	Illegal fishing
Threat / challenge F2	Labrador mixed stock fishery
Threat / challenge F3	Adaptive management of recreational fishing under warm water conditions
Threat / challenge F4	Survival of salmon at sea

2.9 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 2.8 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for the management of salmon fisheries?

Action F1:

Description of action:

Illegal fishing activities

DFO 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, 3 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 3400 inspections/year. Provincial Wildlife Enforcement Officers and DFO will support both regular patrols and special operations.

Gulf and Maritimes regions have developed mapping software that contains historical angling activity along certain rivers in their 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 St. John River. The Miramichi River system will be added in the near future.

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, Tobique).

C&P 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:

	Patrol Hours	Inspections
NL	48,000	3,500
Gulf	6,400	500
Maritimes	4,600	300
Que	40,000	No specific objectives

- Surveillance in Que does not reflect its ZEC managed system

Planned timescale

Post-season and annual reviews of each Fall and Winter,

	(include milestones where appropriate):	respectively from 2019 through to 2024.
	Expected outcome:	Deterrence of illegal activity will be achieved by noting decreasing numbers of poaching incidents due to increased ability to detect such activities and by publicizing penalties on Social Media associated with resulting prosecutions.
	Approach for monitoring effectiveness & enforcement:	Measuring planning effectiveness will be accessed through Post-Season review 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.
	Funding secured for both action and monitoring programme?	Yes
Action F2:	Description of action:	**Labrador mixed-stock fishery** 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. This will require improvements in 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. Beginning in 2019, fishery sample processing will be targeted to areas with higher probability of non-local stock interceptions. Partnerships with Indigenous groups will continue in these sampling activities.
	Planned timescale (include milestones where appropriate):	Annual
	Expected outcome:	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:	Three approaches will be used for monitoring progress: • 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 report 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.
	Funding secured for both action and monitoring programme?	Expected Annual sampling of fisheries catches is supported by DFO and Indigenous communities. Funding for genetic stock identification of fisheries catches is secured into 2019. Funding for subsequent years will be negotiated, with a focus on targeting areas with high risk of non-Labrador origin salmon interception.
Action F3:	Description of action:	**Warm water protocols for adaptive management for 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. This measure is particularly important given that warm waters have been shown to impact fish mortality. 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 (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.
	Planned timescale (include milestones where appropriate):	Where warm water protocols have not been established, protocols will be developed. Reviews of existing protocols and their effectiveness are required. - *Newfoundland and Labrador*: conduct scientific review and amend existing warm water protocol for recreational fisheries for 2019/2020. - *Maritime provinces*: develop river-specific protocols where required based on established protocols and practices for 2019/2020. - *Quebec*: Continue water temperature monitoring in salmon rivers from 2019 to 2024. Complete a scientific study on the impact of catch and release in warm water on the reproductive success of Atlantic salmon in 2020. Develop and test the implementation of warm water protocols in a minimum of two rivers in 2020/2021.
	Expected outcome:	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:	Approach is to develop the protocols in cooperation with user groups, and assess the effectiveness at the end of season in order to modify/refine protocols if needed.
	Funding secured for both action and monitoring programme?	Yes
Action F4:	Description of action:	**Survival of salmon at sea** Throughout the North Atlantic, survival at sea of salmon has declined, particularly for populations in the southern and mid-range of the species. Location and timing of the most important mortality events are still unknown. 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 smolts, seal predation on returning adult salmon in estuaries and rivers, and changes/reductions in the salmon food base that are also subject of fisheries (capelin, herring). 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.
	Planned timescale (include milestones where appropriate):	Such research activities will be supported during the timeframe of Canada's Implementation Plan through the following mechanisms: • The Atlantic Salmon Research Joint Venture (ASRJV) and development of a Science Strategic Research Plan for 2018-2023 to support strategic and collaborative research. • Annual funding of applied research by the Atlantic Salmon Conservation Foundation (ASCF).
	Expected outcome:	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. The annual call for proposals will result in collaboratively funded projects that will increase our understanding of the factors associated with the survival of salmon at sea thus clarifying options for the conservation and management of wild Atlantic salmon populations in Canada and the U.S.

		ASCF annual call for proposals (late fall) for applied research on Atlantic salmon conservation priorities, review of proposals by Science advisory committee, allocation of funds for research, annual reporting of activities to the ASCF.
	Approach for monitoring effectiveness & enforcement:	Annual reporting of research activities to the ASRJV Science Committee and Management Board. Annual reporting of funded research activities to the ASCF.
	Funding secured for both action and monitoring programme?	Yes

3. Protection and Restoration of Salmon Habitat:

In this section please review the management approach to the protection and restoration of habitat in your jurisdiction in line with the relevant NASCO Resolutions, Agreements and Guidelines.

3.1 How are risks to productive capacity identified and options for restoring degraded or lost salmon habitat prioritised, taking into account the principle of 'no net loss' and the need for inventories to provide baseline data? *(Max. 200 words)*
(*Reference: Section 3 of the Habitat Guidelines)*

Risks to productive capacity are not identified directly by regulatory programs but rather indirectly by regulating the loss and degradation of fish habitat through non-fishing activities (works, undertakings, and activities) through the administration of the fish and fish habitat protection provisions of the *Fisheries Act* and certain protections in the *Species at Risk Act* by Fisheries and Oceans Canada (DFO). These acts include the identification and protection of critical habitat for listed aquatic species that are threatened, endangered or extirpated, and requiring habitat offsetting projects prioritized to improve important all habitats, or restore important ecosystem functions in the vicinity of the development project. Canada modernized its federal *Fisheries Act* in 2019, incorporating stronger provisions regarding the recognition and prioritization of fish habitat restoration activities through an integrated planning lens. Initiatives that include regulatory, grant and contribution funding, indigenous knowledge, and scientific/biological information are priorities for the next few years. Details of what works using an informed and adaptive management approach will be shared as this iterative process progresses through annual updates. Regional initiatives are piloting this approach

3.2 How are socio-economic factors taken into account in making decisions on salmon habitat management? *(Max. 200 words)*
(Reference: Section 3.9 of the Habitat Guidelines)

Decisions about the management of fish habitat are made by DFO, include the assessment and management of various biological, social, economic and cultural risks. This risk management is part of the decision-making process and is documented accordingly.

The modernized *Fisheries Act* includes several provisions to identify how decisions will be made while balancing various socio-economic factors. These provisions signal the intent, and in certain cases the requirement, to include factors like the following in decisions related to the management of fish and fish habitat, including Atlantic salmon habitat.

- Indigenous, scientific, and community knowledge

- Social, economic and cultural factors
- Fisheries management objectives

Under *Species at Risk Act*, socio-economic factors are taken into account in the Regulatory Impact Analysis Statement (RIAS) required to put Critical Habitat Orders in place to protect critical habitat.

3.3 What management measures are planned to protect wild Atlantic salmon and its habitats from (a) climate change and (b) invasive aquatic species? *(Max. 200 words each)*
(Reference: Section 3.2 of the Habitat Guidelines)

(a) DFO continues to work collaboratively to address water and land use management issues through ongoing partnerships with the Provinces and resource users to focus on non-fisheries related management measures in response to climate change threats to salmon habitat.

In addition to the fisheries management actions taking place with respect to warm water protocols to restrict angling (see 2.9 Action F4), measures are also taking place from a habitat perspective. For example, in the Miramichi River, cold water pools are being enhanced and maintained to provide refuge to adult Atlantic salmon. In Québec, the new *Regulation respecting the sustainable development of forests in the domain of the State* stipulates that a strip of woodland at least 60 m wide must be preserved on both sides of a salmon river. This riparian buffer zone contributes to countering water warming.

(b) DFO is working with federal, provincial and territorial partners to implement the Aquatic Invasive Species Regulations (AISR) that came into force in 2015. These Regulations provide authorities and tools to prevent the introduction and spread of AIS and to manage existing populations. For example, the AISR enable directions or measures to treat or destroy an aquatic invasive species, treat a conveyance or structure, establish temporary barriers, or post signs to prohibit access. The use of these measures will be assessed on a case by case basis, taking into account the particular circumstances related to the aquatic invasive species in question and potential habitat impacts.

3.4 Identify the main threats to wild salmon and challenges for management in relation to estuarine and freshwater habitat.

Threat / challenge H1	Wide-ranging threats to Canada's Atlantic salmon habitat continue to originate from a variety of activities including, but not limited to, transportation infrastructure, power generation, agriculture, forestry and mining operations (i.e. industrial land-use activities).
Threat / challenge H2	Acid rain, resulting from emission of pollutants from industrial sources is a serious problem known to cause sub-lethal impacts, premature mortality, and in some cases, extirpation of wild Atlantic salmon populations. In Canada, the area most impacted is the Southern Upland of Nova Scotia, where acid rain has a chronic impact in rivers because the geology of the area does not provide sufficient natural buffering.
Threat / challenge H3	Aquatic invasive species and non-indigenous species such as rainbow trout, smallmouth bass, chain pickerel, largemouth bass, muskellunge, and brown trout, pose potential threats to Atlantic Salmon and their habitats throughout Atlantic Canada.

3.5 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 3.4 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat?		
Action H1:	Description of action:	**Threats related to industrial land-use activities** 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. The recently modernized *Fisheries Act* includes provisions related to fish and fish habitat protection, including: - 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.
	Planned timescale (include milestones where appropriate):	The timescale for measures is linked to the implementation of the changes to the *Fisheries Act* made in Bill C-68. Some tools are expected to be developed within 3-5 years.
	Expected outcome:	Greater variety of options for regulatory tools and partnerships to reduce the threat to Canada's Atlantic salmon habitat.
	Approach for monitoring effectiveness & enforcement:	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 information about the Department's regulatory activities.
	Funding secured for both action and monitoring programme?	Expected
Action H2:	Description of action:	**Acid Rain** Reduction and elimination of acid rain-causing emissions are the ideal goals to mitigate losses of wild Atlantic salmon due to acidification. In the meanwhile, liming of watercourses is recognized as an acidification mitigation technique that provides benefits to salmon. The West River Acid Mitigation Project is led by the not-for-profit Nova Scotia Salmon Association (NSSA). The project is entering its 14th year overall and its third year of significant expansion. 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. The following activities will continue during the 2019-2024 Implementation Plan cycle: 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; 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, 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.
	Planned timescale (include milestones where appropriate):	Ongoing. Liming of salmon waters should be planned for the long term (up to 50 years or more) to re-establish natural pH buffering capacity.
	Expected outcome:	The liming project in West River has had very positive results. Parr numbers have increased by more than 300% 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.
	Approach for monitoring effectiveness & enforcement:	Parr numbers will continue to be monitored in limed areas to assess the continued effectiveness of these efforts. Additionally, adult salmon will be measured by a counting fence. Raised awareness or the restoration project by DFO Conservation and Protection and Provincial Conservation Officers will target known by-catch or poaching areas.
	Funding secured	Expected

	for both action and monitoring programme?	
Action H3:	Description of action:	**Aquatic Invasive Species (AIS)** The threat of AIS are being managed as they arise, under various control regimes. DFO is working with federal, provincial and territorial partners to implement the Aquatic Invasive Species Regulations (AISR) that came into force in 2015. In New Brunswick and Prince Edward Island, as the provincial governments are not signatories to the AISR, DFO and the provinces are collaborating closely to manage existing aquatic invasive species. Since 2008, DFO has worked with partners to contain smallmouth bass to the Miramichi Lake through the use of a physical barrier and associated physical control methods. A project proposal of eradication by use of Rotenone has been submitted to DFO for review by various stakeholders in June 2019. As the species was confirmed in the Miramichi River in August 2019, DFO is currently working with stakeholders to implement a short-term action plan aimed at assessing the extent of the spread, removing fish by angling, seining and electrofishing, as well as developing a long-term control strategy to mitigate this threat. In Nova Scotia, through the province and DFO, targeted removals of smallmouth bass and chain pickerel through electrofishing boat capture and other methods on rivers during smolt emigration has been undertaken. In addition, DFO has provided support to the province in a smallmouth bass control/eradication program in Piper Lake in the headwaters of St. Mary's River.
	Planned timescale (include milestones where appropriate):	Implementation of the AISR is on-going and DFO will continue to undertake rapid response efforts with regards to reports of AIS as they arise In response to the current findings of Smallmouth Bass in the Miramichi River, removal of fish by physical means are ongoing since August until the end of October. The development of a long-term control strategy for smallmouth bass in the Miramichi Lake and in the river is expected to be developed in the coming months. Its implementation will be on-going. It is possible that the eradication of Miramichi Lake could occur in Fall 2020 once all required information concerning the safety of its application in that environment has

		been received and pending results of consultations. In Nova Scotia, DFO is supporting the province on a smallmouth bass control and eradication plan for Piper Lake. Anticipated provincially led action fall 2019.
	Expected outcome:	Implementation for the AISR will help to prevent introductions of new AIS and to control and manage existing populations. The long-term control strategy for smallmouth bass in the Miramichi Lake and in the river will help prevent further spread of this invasive species. In Nova Scotia, electrofishing for targeted removal of smallmouth bass and chain pickerel will continue on an annual basis. Data from this activity will be used to inform successfulness of this control and determine future required action.
	Approach for monitoring effectiveness & enforcement:	The population of smallmouth bass in the Miramichi Lake and in the river will continue to be monitored to assess the continued effectiveness of control efforts.
	Funding secured for both action and monitoring programme?	Yes Funding secured for existing control and monitoring activities of smallmouth bass in the Miramichi Lake. Funding for control and monitoring activities in Piper Lake, Nova Scotia has been funded by the province. Funding sources for additional control activities, if required, will be determined as part of the development of the long-term control strategy.

4. Management of Aquaculture, Introductions and Transfers, and Transgenics:

Council has requested that for Parties / jurisdictions with salmon farms, there should be a greater focus on actions to minimise impacts of salmon farming on wild salmonid stocks. Each Party / jurisdiction with salmon farming should therefore include at least one action relating to sea lice management and at least one action relating to containment, providing quantitative data in Annual Progress Reports to demonstrate progress towards the international goals agreed by NASCO and the International Salmon Farmers Association (ISFA):

- *100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms;*
- *100% farmed fish to be retained in all production facilities.*

In this section please provide information on all types of aquaculture, introductions and transfers, and transgenics (including freshwater hatcheries, smolt-rearing etc.

4.1 (a) Is the current policy concerning the protection of wild salmonids consistent with

the international goals on sea lice and containment agreed by NASCO and ISFA? (b) If the current policy is not consistent with these international goals, when will current policy be adapted to ensure consistency with the international goals and what management measures are planned to ensure achievement of these goals and in what timescale? *(Max. 200 words for each)*
(Reference: BMP Guidance)

(a) Yes, Nova Scotia, New Brunswick, and Newfoundland and Labrador each have a policy that is consistent with the international goals on sea lice and containment.

In New Brunswick, sea lice monitoring and containment are regulatory requirements. Containment is discussed by a committee of representatives from provincial and federal governments, NGOs, and industry. Progress includes continued communication with industry and NGOs on breaches, and identification of the origins of captured aquaculture escapees. Integrated sea lice management, including cleaner fish, warm water baths and high pressure water sprays, has led to marked decreases in therapeutant use in the past two years.

Newfoundland and Labrador's Code of Containment for the Culture of Salmonids is a condition of the Province's finfish aquaculture licence. The Province conducts bi-annual inspections of net-cage and surface mooring components. There are also periodic audits of cage systems which includes net strength testing, inventory counts and annual reporting and review. The Province recently updated its fish health policies, which include a Sea Lice Integrated Pest Management Plan.

In Nova Scotia, as part of the *2015 Aquaculture Management Regulations*, the Province has established a sea lice and containment management section within their annual Farm Management Plans that support regulatory requirements.

(b) Yes, while the current policies are consistent with international goals, further improvements are being made towards achieving international goals on sea lice and containment. New Brunswick's Department of Agriculture, Aquaculture and Fisheries, and Newfoundland and Labrador's Department of Fisheries and Land Resources are anticipating changes to aquaculture management, that may include improvements to current sea lice and containment regulatory requirements, as part of their current legislative, policy and planning modernization. It is expected that changes to their regulatory and legislative processes will occur through the 2019-2024 Implementation Plan period.

In addition to changes to provincial regulations, the Federal Government is developing a new Federal Aquaculture Act and General Aquaculture Regulations. It is anticipated that their development and completion will fall within the Implementation Plan period.

4.2 (a) What quantifiable progress can be demonstrated towards the achievement of the international goals for 100% of farms to have effective sea lice management such that there is no increase in sea lice loads, or lice-induced mortality of wild salmonids attributable to sea lice? (b) How is this progress monitored, including monitoring of wild fish? (c) If progress cannot be demonstrated, what additional measures are proposed and in what timescale? *(Max. 200 words each)*
(Reference: BMP Guidance)
The measures by which these goals may be achieved, and against which the Review Group will be measuring the effectiveness of the Implementation Plan, are set out in the BMP Guidance SLG(09)5 (Best management practice; reporting and tracking; factors facilitating

implementation) as agreed by NASCO and ISFA.

(a) Canada's Atlantic provinces are the primary authorities regulating sea lice management on the East Coast.

New Brunswick conducts sea lice audits to ensure accuracy in the counts provided by licence holders. Confidentiality clauses in New Brunswick's legislation do not allow for the release of this type of data.

There have not been demonstrable impacts on wild salmon populations related to sea lice within the waters of Nova Scotia. Further, no sea lice treatment have been required for Nova Scotia's salmon farms between 2016-2019.

The federal *Aquaculture Activities Regulations* (AAR) require aquaculture operators to submit annual reports on pest control products usage to treat diseases and parasites like sea lice (https://open.canada.ca/data/en/dataset/288b6dc4-16dc-43cc-80a4-2a45b1f93383). Between 2016-2018, there has been a 38% decrease in the use of in-feed pest control drugs and 44% decrease in Salmosan usage across the three Atlantic provinces. This was accomplished through a 46% increase in the use of hydrogen peroxide, as well as the increased use of non-therapeutant treatments, over the same time period. Hydrogen peroxide has been shown to have a reduced environmental impact in comparison to the other products.

(b) Progress on sea lice levels is monitored by the Atlantic provinces. Sea lice are regularly counted at marine cage sites on representative samples of fish as identified in provincial regulations. The Atlantic provincial governments collaborate with Fisheries and Oceans Canada (DFO) on the AAR. These regulations require aquaculture operators to submit annual reports on pest control products usage to treat diseases and parasites like sea lice (https://open.canada.ca/data/en/dataset/288b6dc4-16dc-43cc-80a4-2a45b1f93383).

New Brunswick has a comprehensive sea lice monitoring program that requires licence holders, through regulation, to conduct sea lice counts on a weekly basis. Other provisions include reporting and notification of treatments. New Brunswick also conducts a series of sea lice audits to ensure accuracy in the counts being provided.

In Newfoundland and Labrador, this information is contained within company records and is made available for site review upon site visits by provincial staff.

In Nova Scotia, comprehensive health management is required as part of the Aquaculture Management Regulations including all aspects of sea lice prevention, surveillance, notification, and provincial approvals.

(c) New Brunswick is undergoing a legislative and regulatory review process.

Newfoundland and Labrador are undergoing legislative and regulatory changes within the Implementation Plan period. The Province recently updated its fish health policies, which include a Sea Lice Integrated Pest Management Plan.

4.3 (a) What quantifiable progress can be demonstrated towards the achievement of the international goals for achieving 100% containment in all (i) freshwater and (ii) marine aquaculture production facilities? (b) How is this progress monitored, including monitoring of wild fish (genetic introgression) and proportion of escaped farmed salmon in the spawning populations? (c) If progress cannot be demonstrated, what additional measures (e.g. use of sterile salmon in fish farming) are proposed and in what timescale? *(Max. 200 words each)*
(Reference: BMP Guidance)
The measures by which these goals may be achieved, and against which the Review Group will be measuring the effectiveness of the Implementation Plan, are set out in the BMP Guidance SLG(09)5 (Best management practice; reporting and tracking; factors facilitating implementation) as agreed by NASCO and ISFA.

(a)(i) The majority of freshwater hatchery facilities for salmonids within the NASCO Commission area in Canada are land-based recirculating aquaculture systems, for which the risk of escape is extremely low. Moreover, operating licences and related policies dictate technical requirements for containment at freshwater facilities. For example, hatcheries in the Atlantic provinces require either double or triple layers of screening on effluent pipes to reduce the risk of escapes.

There have been zero reported fish escapes in freshwater aquaculture production facilities in New Brunswick and Nova Scotia over the past Implementation Plan period (2013-2018). Other than the reported escape of 100 freshwater fish in Newfoundland and Labrador in 2017, there were zero reported fish escapes during the same Implementation Plan period (i.e., zero escapes in 2013, 2014, 2015, 2016 and 2018).

(a)(ii) Canada has made progress towards achieving the international goals for containment, as defined by the *BMP Guidance*, by ensuring that all aquaculture sites in Canada have provincial regulatory and operational measures, including containment protocols, in place to help reduce/prevent farmed fish escapes. Guidelines and codes of containment have been developed and implemented on salmon farms that are consistent with the *Guidelines on Containment of Farm Salmon* (NASCO document CNL(01)53).

Atlantic provinces with net-pen salmon farms have standard operating procedures in place for containment. Fish escapes are reported to the provincial authorities, as per regulatory requirements (http://www.dfo-mpo.gc.ca/aquaculture/protect-protege/escape-prevention-evasions-eng.html).

In New Brunswick, there were two reported marine aquaculture escapement events in 2019. Prior to this, the last reported marine aquaculture escape event was in 2015.

Since Newfoundland and Labrador's Code of Containment was instituted in 1999, there has been approximately a 75% decline in the number of escaped fish and escape events.

In Nova Scotia, the number of escape events within the past Implementation Plan period has remained low, varying between zero and three events.

(b) In New Brunswick, licence holders are required to comply with containment regulations. To assess progress and to increase transparency, a committee, which represents government, industry and NGOs meets to discuss escape events.

Under the Newfoundland and Labrador's Code of Containment, operators are required to submit annual reports of cage inventories and numbers of escapes.

In Nova Scotia, the holder of a marine finfish aquaculture licence is required to comply with Section 33 of the *Aquaculture Management Regulations*. This requires operators to conduct their aquaculture operation in a manner that is designed to prevent breaches and immediately notify the Department of a known or suspected breach. The notification must include site and operator details, suspected date of breach, species, age, size and weight of fish, approximate number, freshwater place of origin, suspected or confirmed cause and any mitigation efforts.

(c) In Newfoundland and Labrador, research continues to be conducted on sterile, triploid fish to assess the risks to the conservation of wild salmon. Newfoundland and Labrador is anticipating changes to aquaculture management, including containment, as part of their current legislative, policy and planning modernization. Newfoundland and Labrador expects that changes to their regulatory and legislative processes will occur through the 2019-2024 Implementation Plan period.

New Brunswick is anticipating changes to their current legislative, policy, and planning modernization.

In Nova Scotia, the Department of Fisheries and Aquaculture is continuing with the implementation of the requirement for engineer's approval of the design of the structures in place for containment management for existing sites, and any new sites requiring it before fish can enter the water. The first engineer-approved site was established in September 2019. Additionally, Nova Scotia is implementing a salmonid traceability program requiring all finfish operators to have a "marking plan" which will enable escaped fish to be traced back to the operator of origin in Nova Scotia. Initial conversations have begun between the provincial and federal governments on this initiative. The traceability program is anticipated to be completed within the Implementation Plan period.

4.4 What adaptive management and / or scientific research is underway that could facilitate better achievement of NASCO's international goals for sea lice and containment such that the environmental impact on wild salmonids can be minimised? *(Max 200 words)*
(Reference: BMP Guidance and Article 11 of the Williamsburg Resolution)

The following research programs facilitates better achievement of NASCO's international goals for sea lice and containment to minimize the impacts on wild salmonids:

1. The federal Program for Aquaculture Regulatory Research (PARR) funds research that advances the understanding of interactions between aquaculture and the aquatic environment. The program is designed to increase scientific knowledge, inform regulatory decision-making and policy development. Provinces contribute to the planning process for the PARR in order to identify Provincial priorities for research.

2. The federal Aquaculture Collaborative Research and Development Program (ACRDP) fosters government and industry collaboration for research on fish health and ecosystem interactions. Provinces are active members and participate in the review and development of the ACRDP process.

3. The Genomics Research and Development Initiative (GRDI) is a federal program that coordinates science departments and agencies in genomics research. Research includes assessing genetic impacts on wild salmon from escapement.

The federal and provincial governments are funding research to better understand infrastructure failure, such as damage to netting or support structures from environmental conditions. Progress on this contributes towards international goals on containment and may help to inform sea lice and containment management practices for the possible development of standards on finfish aquaculture.

4.5 What is the approach for determining the location of aquaculture facilities in (a) freshwater and (b) marine environments to minimise the risks to wild salmonid stocks? *(Max. 200 words for each)*

(a) Within NASCO's Commission area in Canada, the responsibility for determining and licensing the location of freshwater aquaculture facilities is led by the provinces. DFO supports provincial governments when they are considering site locations by providing scientific information and analysis on fish and fish habitat, including species at risk, related to the review of a particular facility site / licence application.

The siting review processes and timelines vary between provinces, but generally they include a comprehensive internal technical review, which includes looking at impacts to wild populations, consultations with First Nations, and obtaining comments from relevant provincial and federal network partners. Details of each provincial siting review can be found here:

- Nova Scotia freshwater sites: https://novascotia.ca/fish/aquaculture/starting-an-aquaculture-site/
- Newfoundland and Labrador: https://www.fishaq.gov.nl.ca/licensing/aquaculture.html
- New Brunswick: N/A

(b) Within NASCO's Commission area in Canada, provinces have the authority to lease and license marine finfish aquaculture. During a provincial siting review process, DFO provides advice to the provinces on potential impacts to fish and fish habitat, including species at risk.

The siting review processes and timelines vary depending on the province, but generally they include a comprehensive internal technical review of the application and a scoping assessment of potential environmental and wild fish impacts, consultations with First Nations and stakeholders, and obtaining analyses by relevant provincial and federal network partners. The details of each provincial siting review can be found here:

- Nova Scotia marine sites: https://novascotia.ca/fish/aquaculture/starting-an-aquaculture-site/
- Newfoundland and Labrador: https://www.fishaq.gov.nl.ca/licensing/aquaculture.html
- New Brunswick: https://www2.gnb.ca/content/gnb/en/departments/10/aquaculture/content/site_allocation_policy.html

4.6 What progress has been made to implement NASCO's guidance on introductions, transfers and stocking? *(Max. 200 words)*
(Reference: Articles 5 and 6 and Annex 4 of the Williamsburg Resolution)

With respect to NASCO guidance, under the *Fishery General Regulations* (FGR), DFO administers the National Code on Introductions and Transfers of Aquatic Organisms (http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/it-code-eng.htm) and issues introduction and transfer (I&T) licences for the intentional release and transfer of live aquatic organisms into fish bearing waters or fish rearing facilities within NASCO's Commission area in Canada. The National Code is consistent with NASCO's guidelines. Genetic, ecological, and disease risks are addressed.

With respect to Article 5, the Federal Government will continue to manage the potential disease, genetic, and ecological risks to wild Atlantic Salmon associated with I&T through a variety of federal statutory and other instruments including the FGR*;* the *Health of Animals Act*; the National Code on Introductions and Transfers of Aquatic Organisms (the Code); and, the National Aquatic Animal Health Program (NAAHP), which is managed by the Canadian Food Inspection Agency (CFIA).

DFO, CFIA, and the provincial authorities are committed to working together to identify and control diseases of concern.

Atlantic provincial governments have implemented transfer controls under the Certificate of Health for Transfers. This policy, implemented under provincial regulation, outlines the fish health requirements prior to the movement of fish.

4.7 Is there (a) a requirement to evaluate thoroughly risks and benefits before undertaking any stocking programme and (b) a presumption against stocking for purely socio-political / economic reasons? *(Max. 200 words each)*
(Reference: Guidelines for incorporating social and economic factors in decisions under the Precautionary Approach and Annex 4 of the Williamsburg Resolution)

(a) Canada's *Wild Atlantic Salmon Conservation Policy* is explicit that resource management as well as all other decisions must protect the biological foundations of wild Atlantic Salmon populations, including their genetic diversity, and habitats. There are also provisions in the *Fisheries Act* of Canada that allow the federal government to evaluate any proposals involving stocking programs. The Government of Canada complements these legislative and policy instruments by also referencing other tools and guidelines such as the: *2013 Code on Introductions and Transfers* (concerned with the moving of live aquatic organisms) and the *Williamsburg Resolution,* and outlines a series of principles, for stocking. Provincial governments also have specific guidelines and policies concerning stocking activities. Lastly, the Government of Canada frequently undertakes Canadian Science Advisory Secretariat (CSAS) reviews and ad-hoc science-advice when evaluating specific stocking proposals or programs.

In Québec, stocking is further control by the *Regulation respecting aquaculture and the sale of fish* and by administrative processes developed to maximise the benefits and to reduce the risks associated with enhancement activities. These are presented in the Atlantic Salmon Management Plan 2016 - 2026 (MFFP 2016) and in internal policy documents.

(b) There is no presumption against stocking for purely socio-political/economic reasons. However, all stocking programs must be evaluated as per paragraph 4.7 (a). For populations that are threatened or at high risk of extinction, stocking programs, for the purpose of increasing populations to levels that could support fisheries (enhancement), are unlikely to satisfy the regulatory constraints relative to genetic, disease or other adverse effects set out in the *Fishery (General) Regulations*. As presented in NASCO's 2017 Special Session on Stocking, Canada recognizes that stocking activities can present risks to wild salmon conservation. Currently, there are limited stocking activities in Canada, with no sea ranching or fisheries supporting activities occurring.

4.8 What is the policy / strategy on use of transgenic salmon? *(Max. 200 words)*
(Reference: Article 7 and Annex 5 of the Williamsburg Resolution)

Canada's policy on the use of transgenic salmon is stated in the *Canadian Environmental Protection Act, 1999* and implemented through the *New Substances Notification Regulations*. The Regulations state that information must be provided to the Government of Canada at least 120 days prior to the proposed import or manufacture in Canada of a transgenic salmonid. This information is used to conduct a scientific risk assessment to determine whether the transgenic salmonid may have an immediate or long-term harmful effect on the Canadian environment or its biological diversity. The environmental assessment considers potential ecological, genetic, disease and other risks that the transgenic salmonid may pose, including potential impacts on wild salmon populations in Canada. Where such harmful effects are suspected, control measures, including containment requirements, may be imposed as required to manage those risks to the environment. Where such harmful effects are not suspected, the import or manufacture of the transgenic salmonid may proceed as proposed. Where it is suspected that a "significant new activity" (i.e., an activity other than that originally proposed) may pose a risk to the environment, the Government may specify the requirement to submit further information for consideration prior to the commencement of the significant new activity.

4.9 *For Members of the North-East Atlantic Commission only:* What measures are in place, or are planned, to implement the eleven recommendations contained in the 'Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of *Gyrodactylus salaris* and eradicate it if introduced, including the development and testing of contingency plans? *(Max. 200 words)*
(Reference 'Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of G. salaris and eradicate it if introduced, NEA(18)08)

N/A

4.10 Identify the main threats to wild salmon and challenges for management in relation to aquaculture, introductions and transfers, and transgenics.

Threat / Challenge A1	**Sea lice management** Salmon stocked into marine cages are initially free of sea lice, but may acquire sea lice from wild marine fish or from other farmed fish in the area. The result is that many salmon farming areas experience some level of sea lice

	parasitism. There is concern that salmon farms may locally amplify the abundance of sea lice, some of which may then be transferred back to wild fish, potentially impacting wild salmon populations. Heavy infestations of sea lice on fish may potentially pose a threat to wild fish and negatively impact fish welfare and farm productivity.
Threat / challenge A2	**Containment of Farmed Fish** Escape of farmed fish from their containment structures may pose a threat to wild Atlantic Salmon, primarily through the in-river migration of farmed fish, their subsequent spawning, and the introgression of farmed fish genes into the wild salmon gene pool.
Threat / challenge A3	**Fish Health and Emerging Diseases** Potential emerging disease risk is a challenge for aquaculture management and a potential threat to the health of wild salmon. This work is taken seriously by DFO, CFIA, and provincial regulators.
Threat / challenge A4	**Commercial Production of Transgenics** Introgression of transgenic fish genes into the wild salmon gene pool is a risk; however, Canada is well prepared to assess and manage potential environmental risks, including threats to wild salmon, which may be associated with the commercial production of transgenic salmonids. While Canada's regulatory framework does not *a priori* require that transgenic salmonids be confined to secure, land-based facilities, it does provide authority to impose such containment requirements where needed, based on the outcome of a science-based risk assessments.

4.11 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 4.10 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for aquaculture, introductions and transfers, and transgenics?		
Action A1:	Description of action:	**Sea lice** The Atlantic provinces are the primary regulatory authority to establish measures aimed at controlling sea lice levels on salmon farms in the region, and are best placed to report on specific actions and strategies for minimizing the risk of sea lice transfer between wild and farmed fish. Within 2019-2024, DFO is conducting an engagement process for amalgamating and developing the Federal Aquaculture Act and the General Aquaculture Regulations. These proposed provisions would be developed in consultation with all provinces and territories. This process will review current regulations and seek to strengthen them, where possible.

		It is anticipated that their development and completion will fall within the Implementation Plan period. In New Brunswick, the new non-therapeutant sea lice control measures that are in place, such as warm water baths and high pressure water sprays, have greatly reduced the use of approved theraputants. Regulatory requirements are in place for weekly sea lice counts, which are audited by the Department of Agriculture, Aquaculture and Fisheries. Sea lice are managed under the Integrated Pest Management Plan for Sea Lice, using measures such as single year-class farming, site fallowing, prevention, rotation of treatment regimes, monitoring, etc. Further, the province's anticipated legislative and regulatory review process is expected to encompass additional measures for sea lice management. Newfoundland and Labrador is undergoing a legislative and regulatory review process, which will include modernization of their fish health management policies. In Nova Scotia, as part of the 2015 *Aquaculture Management Regulations*, there are provisions associated with sea lice management. The Province has specifically established a sea lice management section within their annual Farm Management Plans that support the regulatory requirement, and establishes minimum procedures for managing sea lice. The current management regime has maintained sea lice numbers below treatment levels, and will be maintained and adapted, as required, over the Implementation Plan period.
	Planned timescale (include milestones where appropriate):	The Federal Government is developing a new Federal Aquaculture Act and General Aquaculture Regulations. It is anticipated that their completion and implementation will fall within the Implementation Plan period. As part of their current legislative, policy and planning modernization, both New Brunswick's Department of Agriculture, Aquaculture and Fisheries, and Newfoundland and Labrador's Department of Fisheries and Land Resources are anticipating changes to their aquaculture regimes. Newfoundland and Labrador expects that changes to their regulatory and legislative processes will occur through the 2019-2024 Implementation Plan period.
	Expected outcome:	Improved implementation and coordination of sea lice management through new regulations, policies and agreements, research, improved monitoring, and dissemination of information on farmed fish containment.
	Approach for	The approach will be clarified in future reports, as development

	monitoring effectiveness & enforcement:	is pending government decisions to proceed.
	Funding secured for both action and monitoring programme?	Expected
Action A2:	Description of action:	**Containment of Farmed Fish** The Federal Government supports the goal to achieve 100% containment of fish, whether reproductively viable or not, in order to manage ecological, genetic and disease risks. Within the Implementation Plan period, DFO is conducting an engagement process for amalgamating and developing the Federal Aquaculture Act and the General Aquaculture Regulations. These proposed provisions would be developed in close consultation with all provinces and territories. This process will review current regulations and seek to strengthen them, where possible. Federally-funded research is ongoing to quantify the magnitude of escapes, and the annual variation in hybridization through targeted surveys. Science advice from this research will be used to inform the development of any new legislative or regulatory approaches to the management of containment and the impacts of escapement. Additionally, Canada is leading an international research effort that is evaluating models that predict population-level impacts from escaped farmed salmon on wild salmon stocks. In New Brunswick, progress continues with ongoing dialogue through the New Brunswick Aquaculture Containment Liaison Committee, which is comprised of members from the provincial and federal governments, as well as conservation groups and the Atlantic Canada Fish Farmers Association. This progress includes increased communication with industry and NGOs in responding to, and following up on breaches of containment from aquaculture facilities in Atlantic Canada. Work of the Committee, with industry assistance, has led to the origin identification of aquaculture escapees captured in the wild. The Code of Containment for the Culture of Salmonids in Newfoundland and Labrador continues to be implemented as a condition of the salmonid aquaculture licence. Further, the Newfoundland and Labrador's Department of Fisheries and Land Resources is working to make changes to the Code as part of its legislative, policy and planning modernization. This will improve and further clarify containment practices and regulations in the province.

		Nova Scotia is currently creating a Traceability Program that will establish mechanisms that will enable regulators to trace salmonids caught in a water body back to the operator of origin. This is being done through the Nova Scotia Salmonids Traceability Committee, made up of stakeholders from federal and provincial agencies, industry, and angling associations. The Committee established criteria that will form the basis of the traceability requirements for salmonid growers in Nova Scotia. These minimums have been established and the supporting policy is currently being developed. Based on recommendations from the Committee, changes are being made to the Nova Scotia *Aquaculture Management Regulations* to accommodate the traceability program. An Engineering Working Group has also been established by Nova Scotia to contribute to and comment on the creation of policy around containment structures. The province is currently working on developing policies that will define the requirements and processes for the certification and auditing of aquaculture infrastructure designs and installation in the marine environment.
	Planned timescale (include milestones where appropriate):	The Federal Government is developing a new *Federal Aquaculture Act* and General Aquaculture Regulations. It is anticipated that their development and completion will fall within the 2019-2024 Implementation Plan period. Federally-funded research that is ongoing to better understand escapement and the impacts of farm escaped Atlantic salmon on wild stocks (as described in detail above) is expected to conclude in 2019. New Brunswick's Department of Agriculture, Aquaculture and Fisheries, and Newfoundland and Labrador's Department of Fisheries and Land Resources are anticipating changes to aquaculture management, including containment, as part of their current legislative, policy and planning modernization. Newfoundland and Labrador expects that changes to their regulatory and legislative processes will occur through the 2019-2024 Implementation Plan period. Nova Scotia's traceability program is anticipated to be completed within the Implementation Plan period (2019-2024).
	Expected outcome:	Improved implementation and coordination of farmed fish containment through new regulations, policies, and agreements. Improved research and understanding on containment and impacts of farmed fish on wild stocks.

		Improved monitoring, and dissemination of information on farmed fish containment.
	Approach for monitoring effectiveness & enforcement:	Governance process of federal-provincial management committees and technical working groups, either existing or to-be-established, as required. Public reporting of measures and outcomes.
	Funding secured for both action and monitoring programme?	Expected
Action A3:	Description of action:	**Fish Health and Emerging Diseases** The management of risks to wild salmon associated with introductions and transfers is undertaken under a variety of federal statutory instruments, policies, and programs, such as the *Fishery (General) Regulations* under the *Fisheries Act*, *Health of Animals Act*, National Code on Introductions and Transfers of Aquatic Organisms, and the NAAHP. Federally, these instruments manage the potential disease, ecological, and genetic risks associated with the movement of aquatic organisms, including Atlantic salmon. DFO fish health research is ongoing and contributes to the Department's ability to identify and address threats to wild fish and ecosystem health. DFO, CFIA, and the provincial authorities continuously work together to identify and manage diseases of concern. For example, a policy is currently being developed to establish a federal emerging disease committee (between the CFIA and DFO) that would identify, assess, and recommend potential federal management actions, and clarify roles and responsibilities. In New Brunswick, there are a number of provisions in their legislation and regulations related to aquatic animal health. Currently the Province conducts monthly fish health surveillance of each site, both by veterinarians and fish health care professionals. The Certificate of Health for Transfer has been developed by Atlantic provincial veterinarians to help ensure healthy stocks are transferred between hatcheries and to the sea cage environment. In the Atlantic provinces, the movement of live salmon between sea cages is not authorized. The Atlantic provinces utilize the Certificate of Health for Transfer to mitigate disease risk. Newfoundland and Labrador's Department of Fisheries and Land Resources is in the process of

		policy modernization regarding fish health management as part of their legislative, policy and planning modernization. They conduct an aquatic animal health surveillance program for aquatic animal diseases In Nova Scotia, as part of the 2015 *Aquaculture Management Regulations*, there are a number of regulations associated with aquatic animal health. The Province has specifically established an aquatic animal health section within their annual Farm Management Plans that support the regulatory requirements for aquatic animal health. This establishes minimum requirements for procedures and protocols for finfish husbandry and welfare, veterinary care and disease surveillance, biosecurity measures, and general emergency measures, including culling or mass stock depopulation practices. The Regulations also require mandatory reporting and authority to control disease through isolation, quarantine, depopulation, biosecurity measures, movement controls and fallowing. Pathogen spread is managed through a regulated requirement for a Certificate of Health for Transfers.
	Planned timescale (include milestones where appropriate):	DFO will deliver disease risk assessments, as planned, by the September 2020 deadline specified in the Cohen Commission report. This includes the delivery of ten individual peer-reviewed disease risk assessments, as well as a peer-reviewed risk assessment of the synthesis of the risk to Fraser River Sockeye Salmon from pathogens that can cause disease on Atlantic Salmon farms in the Discovery Islands, prior to September 2020. The scientific evidence from these risk assessments will inform the management of disease risks associated with wild-farmed salmon interactions in Atlantic Canada. Six risk assessments have been completed, to date (2019). In addition, upon request from CFIA, DFO is currently examining impacts to wild Atlantic Salmon from the transmission of Infectious Salmon Anaemia virus (ISAv) originating from Atlantic Salmon farms in Atlantic Canada. A risk assessment is expected to be completed and formal advice delivered by 2021. New Brunswick and Newfoundland and Labrador are undergoing legislative and regulatory changes. Newfoundland and Labrador expects that changes will occur within the 2019-2024 Implementation Plan period.
	Expected outcome:	Better interdepartmental communication and coordinated federal action to manage emerging diseases of aquatic organisms, including Atlantic Salmon on the Atlantic Coast.

	Approach for monitoring effectiveness & enforcement:	Federal management committee (to be established within the 2019-2024 Implementation Plan period).
	Funding secured for both action and monitoring programme?	Yes
Action A4:	Description of action:	**Commercial Production of Transgenics** There is no production of transgenic fish in Nova Scotia. New Brunswick does not allow the use of marine transgenic fish. There is no policy prohibiting use of transgenic in Newfoundland and Labrador. The Newfoundland Aquaculture Industry Association (NAIA) has stated that transgenic fish will not be used. Members of the Canadian Aquaculture Industry Alliance (CAIA), which represents the majority of farmed salmon facilities in Canada, do not farm or sell GM salmon, and are not growing or researching transgenic salmon. Production of transgenic salmon occurs only in one Canadian land-based production facility. Canada plans to continue to rigorously implement, and enforce its legislative and regulatory process for living organism products of biotechnology, including transgenic salmonids. Canada plans to continue to invest in contained, land-based laboratory research involving transgenic fish to generate scientific knowledge to inform risk assessments, risk management and regulatory approaches aimed at protecting the aquatic environment, including wild salmon populations. In keeping with Annex 5, paragraph d) of the Williamsburg Resolution, DFO has established the Centre of Expertise on Aquatic Biotechnology Regulatory Research, where contained, land-based research is undertaken to provide scientific knowledge that informs the risk assessment, risk management and regulatory approaches for transgenic salmonids. To facilitate decision-making in the absence of full scientific certainty, where there is a risk of serious or irreversible harm, the Government of Canada has developed a Framework for the Application of Precaution in Science-Based Decision Making about Risk. This approach is aligned with Article 7 of the

		Williamsburg Resolution.
	Planned timescale (include milestones where appropriate):	Ongoing regulatory implementation and enforcement. Ongoing research, as funding permits. Nova Scotia, New Brunswick and Newfoundland and Labrador do not allow the production of marine transgenic fish. There are no anticipated actions planned by the Atlantic provinces to address transgenics within the Implementation Plan period.
	Expected outcome:	Government of Canada decision-makers have access to scientific knowledge for the risk assessment and regulation of fish products of biotechnology (immediate outcome). Fish products of biotechnology that do not harm the environment or wild salmon populations (long-term outcome).
	Approach for monitoring effectiveness & enforcement:	The Compliance and Enforcement Policy for the *Canadian Environmental Protection Act, 1999* specifies that: – Compliance with the Act and its regulations is mandatory; – Enforcement officers throughout Canada will apply the Act in a manner that is fair, predictable and consistent. They will use rules, sanctions and processes securely founded in law; – Enforcement officers will administer the Act with an emphasis on prevention of damage to the environment; – Enforcement officers will examine every suspected violation of which they have knowledge, and will take action consistent with this Compliance and Enforcement Policy; and, – Enforcement officers will encourage the reporting of suspected violations of the Act. Furthermore, proposed intentional movements of live transgenic fish will also be assessed for genetic, ecological, and disease risks by Introductions and Transfers Committees established in each province and the Yukon, following the National Code on Introductions and Transfers of Aquatic Organisms. Disease risks of transgenic fish are also addressed by the CFIA's National Aquatic Animal Health Program (NAAHP).
	Funding secured for both action and monitoring programme?	Yes