North American Commission Annual Report (Tabled by Canada)

Submitted by: Fisheries and Oceans Canada
Date: Data cover calendar year 2021

1. Summary of salmonid controlled disease incidents

The Canadian Food Inspection Agency (CFIA) is responsible for Canada's National Aquatic Animal Health Program and is the Competent Authority for aquatic animal health which includes meeting Canada's international reporting obligations to the World Organization of Animal Health (OIE) under the World Trade Organization (WTO) Sanitary and Phytosanitary (SPS) Agreement.

The CFIA updates the health status of Canada's aquatic animals monthly as mandatory notifications of aquatic animal diseases are confirmed (See Annex).

For more information, please consult the CFIA website or contact:

- Disease Status in Canada: Dr. Martin Appelt, Senior Director, Animal Health Directorate, Animal Health Programs Division, Programs and Policy Branch, CFIA. Martin.Appelt@inspection.gc.ca
- International Trade: Dr. Nancy Rheault, Director, Animal Import/Export Division, International Affairs Branch, CFIA. Nancy.Rheault@inspection.gc.ca

2021 summary of federally reportable diseases of salmonids

https://www.inspection.gc.ca/animal-health/aquatic-animals/diseases/reportable-diseases/federally-reportable-aquatic-animal-diseases/eng/1339174937153

Current as of: 2021-12-31

Disease	**Total (Atlantic Region)**
Ceratomyxosis (*Ceratomyxa shasta*)	0
Infectious haematopoietic necrosis	0
Infectious pancreatic necrosis	1
Infectious salmon anaemia	39
Viral haemorrhagic septicaemia	0
Whirling disease (*Myxobolus cerebralis*)	0

Confirmed cases of federally reportable diseases in 2021 that affected salmonids[1] in the Atlantic Region are summarized in the tables below.

[1] Reporting does not distinguish whether the salmonids were cultured or wild.

Locations infected with infectious pancreatic necrosis[2]:

Date confirmed	Location	Animal type infected	Scientific Name
March 17	Nova Scotia	Rainbow trout	*Oncorhynchus mykiss*

Locations infected with infectious salmon anaemia[3]:

Date confirmed	Location	Animal type infected	Scientific Name
December 17	New Brunswick	Atlantic salmon	*Salmo salar*
December 10	Newfoundland	Atlantic salmon	*Salmo salar*
December 6 Table note *	Prince Edward Island	Atlantic salmon	*Salmo salar*
November 26	New Brunswick	Atlantic salmon	*Salmo salar*
November 26	New Brunswick	Atlantic salmon	*Salmo salar*
November 15 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
November 1	New Brunswick	Atlantic salmon	*Salmo salar*
August 20	New Brunswick	Atlantic salmon	*Salmo salar*
August 11	New Brunswick	Atlantic salmon	*Salmo salar*
July 30	New Brunswick	Atlantic salmon	*Salmo salar*
July 27 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
July 14	New Brunswick	Atlantic salmon	*Salmo salar*
July 13	Newfoundland	Atlantic salmon	*Salmo salar*
July 13	Newfoundland	Atlantic salmon	*Salmo salar*
June 29 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
June 9 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
June 9	New Brunswick	Atlantic salmon	*Salmo salar*
May 21 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
May 21	New Brunswick	Atlantic salmon	*Salmo salar*
May 21	New Brunswick	Atlantic salmon	*Salmo salar*
May 21	New Brunswick	Atlantic salmon	*Salmo salar*
May 12	New Brunswick	Atlantic salmon	*Salmo salar*
May 12	New Brunswick	Atlantic salmon	*Salmo salar*
May 12	Newfoundland	Atlantic salmon	*Salmo salar*
May 12	Newfoundland	Atlantic salmon	*Salmo salar*
May 3	Newfoundland	Atlantic salmon	*Salmo salar*
May 3	Newfoundland	Atlantic salmon	*Salmo salar*
March 29	New Brunswick	Atlantic salmon	*Salmo salar*
Mar 19 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
March 8	New Brunswick	Atlantic salmon	*Salmo salar*

[2] https://inspection.canada.ca/animal-health/aquatic-animals/diseases/reportable-diseases/infectious-pancreatic-necrosis/locations-infected/eng/1549521244435/1549521244700

[3] https://inspection.canada.ca/animal-health/aquatic-animals/diseases/reportable-diseases/isa/locations-infected/eng/1549521878704/1549521878969

Locations infected with infectious salmon anaemia[3]:

Date confirmed	Location	Animal type infected	Scientific Name
Feb 18 Table note *	Nova Scotia	Atlantic salmon	*Salmo salar*
February 10	New Brunswick	Atlantic salmon	*Salmo salar*
February 9	New Brunswick	Atlantic salmon	*Salmo salar*
Jan 25 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
Jan 25 Table note *	New Brunswick	Atlantic salmon	*Salmo salar*
January 19	New Brunswick	Atlantic salmon	*Salmo salar*
January 19	Newfoundland	Atlantic salmon	*Salmo salar*
January 8	New Brunswick	Atlantic salmon	*Salmo salar*
January 5	New Brunswick	Atlantic salmon	*Salmo salar*

*Table Note * This virus strain is not known to cause disease.*

2. Summary of breaches of containment of salmonids from net cages

There are no marine net-pens in Quebec or Prince Edward Island.

New Brunswick[4] had no reported breach events in 2021.

In Nova Scotia[5], on three separate occasions in 2021, a single salmon was reported as found outside of licensed aquaculture farms (2 live, 1 dead). The three salmon are suspected to be farmed however the exact origin of the fish has not been confirmed. There was also one escape event in late 2021 of rainbow trout. The estimated number of escaped fish is currently unknown, but will be confirmed after the fish are harvested in late 2022. Once a reconciliation of numbers is undertaken, this information will be communicated to the North American Commission.

There were two escape incidents reported in Newfoundland and Labrador[6] in 2021. On June 14th, 2021 there was a report that 10,000 200 gram Atlantic salmon smolt escaped due to a hole in the net caused by a predator. This occurred in an isolated freshwater pond without wild salmon populations, thus preventing any farmed-wild interactions stemming from this escape. Recapture efforts also occurred under the direction of DFO. On October 3rd, 2021, a report was made that four harvest sized Atlantic salmon were observed outside of the net during harvesting/handling of fish. DFO determined no recapture efforts were required.

3. Summary of Salmonid introductions from outside the Commission Area

[4] In New Brunswick, reporting and management plan requirements for escapes are specified under Section 14.1 of the *NB Regulation 91-158: General Regulation* under the provincial *Aquaculture Act*.

[5] In Nova Scotia, as part of the 2015 *Aquaculture Management Regulations*, the Province requires a containment management section within annual farm management plans (FMPs), which includes details on the operator's response to a containment breach.

[6] In Newfoundland and Labrador, escape reporting in managed by the Code of Containment for the Culture of Salmonids, which is a condition of all salmonid aquaculture site licences in the Province, but is co-administered by the Province and DFO. The code requires licensees to immediately report escape incidents to both DFO and the provincial Department of Fisheries, Forestry and Aquaculture. The Province also requires public reporting (via the NAIA website) within 24 hours of escapes and disease events.

Species (strain, if applicable)	**Number**	**Life Stage**	**Origin[1]**	**Destination [2]**	**Purpose[3]**	**Land-Based or Marine**
Arctic Char (*Salvenius alpinus*)	60,000	Eggs	Yukon	Québec	Aquaculture	Land-Based
Arctic Char (*Salvenius alpinus*)	25,000	Eggs	Yukon	Québec	Aquaculture	Land-Based
Atlantic Salmon *(Salmo salar)*	4,500,000	Eggs	Stofnfiskur, Iceland	Marystown, NL	Aquaculture	Land-Based
Atlantic salmon *(Salmo salar)*	1,044,000	Eggs	Stofnfiskur, Iceland	Marystown, NL	Aquaculture	Land-Based
Atlantic Salmon *(Salmo salar)*	40,000	Eggs	Hafnarfjordur, Iceland	CATC Victoria, PE	Research	Land-Based
Atlantic Salmon *(Salmo salar)*	40,000	Eggs	Hafnarfjordur, Iceland	Elanco Canada, Victoria, PE	Research	Land-Based
Atlantic Salmon *(Salmo salar)*	40,000	Eggs	Hafnarfjordur, Iceland	CATC Victoria, PE	Research	Land-Based
Atlantic Salmon *(Salmo salar)*	40,000	Eggs	Hafnarfjordur, Iceland	CATC Victoria, PE	Research	Land-Based
Atlantic Salmon *(Salmo salar)*, Saga Strain	46,000	Eggs	Hafnarfjordur, Iceland	Centre Burlington, NS	Culture	Land-Based
Atlantic Salmon *(Salmo salar)*, Saga Strain	63,597	Eggs	Hafnarfjordur, Iceland	Centre Burlington, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	110,000	Eggs	Washington State, USA	St. Andrews, NS	Stocking/Enhancment	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	450,000	Eggs	Washington State, USA	Merigomish, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	15,000	Eggs	Riverance, Seattle, USA	Northhampton, N.B, IF-0752	Stocking	Freshwater Ponds
Rainbow Trout (*Oncorhynchus mykiss)*	125,000	Eggs	Washington, USA	Québec	Aquaculture	Land-Based

Rainbow Trout *(Oncorhynchus mykiss)*	2,000	Eggs	Troutlodge - Washington, USA	CATC Victoria, PE	Research	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	1,000,000	Eggs	Rochester - Washington, USA	Ocean Trout Fams Brookvale, PE	Aquaculture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	1,000,000	Eggs	Sumar - Washington, USA	Ocean Torut Farms Brookvale, PE	Aquaculture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*	30,000	Eggs	Troutlodge - Washington, USA	CATC Victoria, PE	Research	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Lyndon Strain	20,000	Fingerlings	New Dundee, Ontario	Waverly, NS	Biotoxin	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Riverence Strain	300,000	Eggs	Washington State, USA	Sunnybrook, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Riverence Strain	300,000	Eggs	Washington State, USA	Sunnybrook, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Steelhead Strain	26,076	Eggs	Washington State, USA	Centrelea, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Steelhead Strain	30,000	Eggs	Washington State, USA	Centrelea, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Steelhead Strain	618,000	Eggs	Washington State, USA	Wolfville, NS	Culture	Land-Based
Rainbow Trout *(Oncorhynchus mykiss)*, Steelhead Strain	600,000	Eggs	Washington State, USA	Wolfville, NS	Culture	Land-Based

Notes:

1. This would be the province or state for introductions from the west coast; or country for international introductions. It was decided that introductions between Canada and the US that are within the NASCO Commission Area (between Maine and New Brunswick, for example) would not be included here as those introductions would be captured in other avenues (ICES WGITMO, for example) and because these are not as relevant.
2. The more specific the information the better, however, Bay level is considered sufficient.
3. This refers to the intention for the introduction – aquaculture, research, stock enhancement, etc.

4. Summary of Transgenic activities within the Country [Annex 1 of NAC (10)6]

In 2021, there were no known violations of the *Canadian Environmental Protection Act* in respect of transgenic Atlantic salmon.

In 2021, there was no production of transgenic fish in Nova Scotia, New Brunswick or Newfoundland and Labrador.

Members of the Canadian Aquaculture Industry Alliance (CAIA), which represents the majority of farmed salmon facilities in Canada, do not farm or sell transgenic (genetically modified) salmon, and are not growing or researching transgenic salmon. Outside of CAIA's membership, there are two commercial facilities owned by an American firm in Canada that produce transgenic salmon: one in Fortune, Prince Edward Island and the second Rollo Bay, Prince Edward Island. Both are land-based facilities.

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.

Although the following project is unrelated to transgenic activity, Canada has agreed to provide introductions and transfers information regarding Newfoundland and Labrador's Grieg Project in future North American Commission reports, as available. Grieg is proposing to construct and operate 11 marine-based farms in Placentia Bay, Newfoundland. Each marine-based farm will consist of multiple cages with nets extending down to 43 meters. The project proposal was received in February 2016 and has undergone a series of provincial and federal reviews and assessments. More information on the timeline and other relevant documents are publically available from the Province of Newfoundland and Labrador at https://www.gov.nl.ca/mae/projects/project-1834/. Grieg introduced their first batches of triploid European salmon eggs at their land-based hatchery in Marystown in 2020 (see section 3) and had planned to stock a marine-based site in 2021 in Placentia Bay, Newfoundland. After a suspected ISA virus detection in 2021 they culled the hatchery population and plan to stock two marine sites in 2022. Prior to DFO's approval to transfer smolt to marine cages, the company will be sampling fish (via blood) to verify triploidy. The development of a triploid verification methodology was a condition of release from their provincial environmental assessment, and was approved by both the provincial and federal governments.

Annex 1

Additional Information

- Information on all confirmed findings of regulated diseases is publicly available on the CFIA's website (see http://www.inspection.gc.ca/animals/aquatic-animals/diseases/reportable/2017/eng/1339174937153/1339175227861).
- The CFIA also maintains information on the status in Canada of controlled diseases in Canada (see http://www.inspection.gc.ca/animals/aquatic-animals/eng/1299155892122/1320536294234).

Annex 2

Response to Questions from the United States:

Section 1 - Summary of Salmonid disease incidences

Question: *What was the disposition of ISAv positive fish that were from sea cages?*

Response: If the above question is asking how the fish appeared clinically, one will see a table note[7] beside some of the cases which indicates if the virus strain is not known to cause disease.

Section 2 – Escapes:

Question: *Of the known escape of rainbow trout, were there efforts to recapture these fish? If the breach was significant, one might expect a noticeable drop in feed. Could that be used, along with other variables, to come up with an estimate of the number of escaped fish?*

Response: Aquaculture operators in Nova Scotia are required to adhere to the Aquaculture Management Regulations (AMR) and Farm Management Plan program (FMP). The AMR and FMP outline the requirements for operators in the event of a known or suspected breach event. For this event, there were no specific recapture efforts but increased angling was noticed in the area near the cages. However, the waterbody (saltwater) is stocked for angling purposes by Provincial fish hatcheries so the origin of the fish caught through angling activity is uncertain. The possibility of interaction between the escaped fish and wild fish (salmon or otherwise) is similar to the possibility of interaction between the Provincially stocked fish and wild fish.

For this particular escape event, it would be difficult to use feed records to reconcile the potential escape numbers. Some of the remaining captive fish were transferred to other cages with varying feeding regimes since time of notification of the escape event. Additionally, as fish reach market size they could be harvested for market. For these reasons, we rely on reconciliation of numbers post complete harvest for escape events.

Section 3 - Introductions and Transfers:

Question: *The roughly 5,544,000 NNA eggs transferred to Marystown, NL facility from Stofnfiskur are listed as land-based. Is the entire production cycle in a land-based facility or will these fish eventually be stocked in coastal waters?*

Response: The NNA eggs are imported to the land-based hatchery in Marystown, NL and raised to the smolt stage prior to transferring them to the marine sites for maturation to market sized adult fish.

Question: *What is the established threshold for triploidy on European salmon eggs that are proposed for stocking into marine net pens?*

Response: The established threshold for triploidy, as recommended by DFO Science, is equal to or greater than 95%. This advice is documented in the most recent CSAS review of five Grieg marine sites for Placentia Bay[8]. There is an established triploidy sampling methodology that is conducted by a third party on a sample of smolt from each batch of eggs prior to the issuance of a transfer licence to the marine sites.

[7] Locations infected with infectious salmon anaemia: https://inspection.canada.ca/animal-health/aquatic-animals/diseases/reportable-diseases/isa/locations-infected/eng/1549521878704/1549521878969

[8] See CSAS review here: https://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2022/2022_019-eng.html

The first transfer of triploid (sterile) salmon to a marine cage grow-out site in Placentia Bay occurred the week of May 16, 2022. The company provided confirmation that the fish, which are of European origin, are adequately triploid (99.4%), which was a condition of the environmental approval for the project.

Section 4 - Transgenics (Grieg Aquaculture Project):

Question: *In regard to the ISA outbreaks in commercial net pens in 2021 with some of those in NL, we do have some concerns that the large number of fish planned to be raised at the Grieg sites in NL could possibly lead to a considerable increase in ISA infections given that triploid stocks have been shown to have a compromised immune system due to triploidy induction. Has there been any discussions on measures that could be taken to minimize this risk?*

Response: Grieg is planning a phased approach for stocking sites in Placentia Bay. This will allow monitoring of performance before maximum production levels are realized in later years.

Additionally, the Grieg NL Project has undergone stringent federal and provincial review processes. After careful review, the culture of all-female triploid Atlantic salmon, was approved for development. The Province conducts aquatic animal health passive and active surveillance of marine sites and on-land facilities and has the responsibility to introduce aquatic animal health measures, in conjunction with industry producers, necessary for optimizing cultured aquatic organism health and to mitigate risks when encountered.