North American Commission Annual Report (Tabled by the United States)

United States, 2021 Activities
Submitted by: National Marine Fisheries Service
Date: April 29, 2022

1. Summary of Salmonid disease incidences

In 2021, 147 sea-run adult Atlantic salmon were captured at the Milford Trap on the Penobscot River and taken to Craig Brook National Fish Hatchery (CBNFH). These fish are used as broodstock in support of a conservation hatchery program geared towards preventing further loss of genetic diversity of the Penobscot River stock of Atlantic salmon. At CBNFH, each fish is tested for pathogens of concern. In May, one of the fish being held for broodstock tested positive for the pathogenic strain of Infectious Salmon Anemia virus (ISAv), though showed no clinical signs of disease. Following the initial diagnosis, the fish was removed from the population, euthanized and samples were sent to the Animal Plant and Health Inspection Service National Veterinary Services Lab (APHIS NVSL) for further analysis. Samples of whole blood, blood preserved in rnaLater and Hank's Balanced Salt Solution (HBSS), tissue (kidney, heart, spleen) and gills were taken. The polymerase chain reaction (PCR) analysis showed ISAv was detected in all the whole blood and preserved blood samples; mixed results from the tissue samples and not detected in the gill samples. Further interpretation of the report was provided by Lamar Fish Health Center indicating the fish had the Norwegian sequence of the ISA virus. The remaining fish in the pool (n=33) were quarantined and retested for the ISAv pathogen. All of the fish tested negative and remained at the facility and were spawned.

In 2021, the Maine Department of Marine Resources (MDMR) was given a notification from Cooke Aquaculture for the detection of the pathogen, *Piscirickettsia salmonis*, a bacterium that causes Salmon Rickettsia Syndrome (SRS), at a net-pen rearing site (Broad Cove) near Eastport, Maine. Further discussions with the MDMR and the Aquatic Animal Health Technical Committee (AAHTC) are currently underway to better understand the outbreak and, if appropriate, recommend measures to minimize the likelihood of this occurring in the future. The group is also considering adding this to the list of pathogens of regulatory concern found in the State of Maine DMR Chapter 24 Importation of Live Marine Organisms.

U.S. Point of Contact on Disease:

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

There were no reported escapes in 2021.

Species (Strain, if applicable)	Number[1]	Average size of fish[2]	Location[3]	Result[4]	Cause of the breach	Date

There were no reported escapes, and as such, this table has intentionally been left blank.

1. This should be the best estimate possible, though it is recognized that exact numbers may be difficult to obtain.
2. Based on the codes of containment, it was agreed that average size is a more accurate measurement than lifestage.
3. The more specific the information the better, however Bay level is considered sufficient.
4. This refers to using recapture methods as detailed in the relevant code of containment and summarizing the results of the recapture attempt.

Notes:

For commercial aquaculture permits in Maine (the location of all Atlantic salmon aquaculture in the eastern United States), a "reportable escape" is defined as any escape greater than 50 fish at sites where individual fish weigh more than 2 kg. For sites where the individual fish weigh less than 2 kg, operators must report any escape that exceeds 25% of cage biomass.

In 2021, no known escapes of farmed fish were reported from the commercial salmon farming industry; however, in September, there were four aquaculture origin fish captured by staff at the Brookfield Power hydropower facility located on the Union River in Ellsworth, Maine. Following proper protocols upon capture in the fish trap, Brookfield Power and MDMR coordinated an investigation into the origin of the putative aquaculture escapees which were captured over several days. Immediately after capture, scales and tissue samples were taken from the fish to identify their origin. Scale analyses done in the field showed that fish originated in a hatchery, but it was impossible to determine if they originated from a commercial facility or a federal facility as part of ongoing recovery efforts. Therefore, the fish were immediately released back to the river just downstream of the fishway. The follow-up genetic analyses found all of the captured fish originated from a commercial Atlantic salmon grow-out site (Black Island South) in Penobscot Bay that belonged to Cooke Aquaculture. A follow-up Containment Management System audit was inconclusive as to the cause of the escape from the facility. Discussions are ongoing with Cooke Aquaculture to investigate the cause of the escape event and, if appropriate, implement standard operating procedures to eliminate similar escapes in the future. Any updates on the investigation will be reported on in the next NAC report.

3. Summary of Salmonid introductions from outside the Commission Area

Listed below is information on salmonids brought into the Commission Area in 2021. No salmonids that originate from outside the NAC area are stocked directly into salmon rivers in Maine. The vast majority of fish brought in from outside the Commission area are stocked in inland ponds and lakes (e.g., private "farm ponds") and, thus, pose no identifiable risk to Atlantic salmon in the wild as there are no connections between the water bodies where these fish are stocked and waters where Atlantic salmon occur. Any potential risks are further minimized by strict fish health regulations (both state and federal) as well as distance from salmon rivers in Maine.

It should be noted that Whole Oceans, a company with plans to develop a land-based aquaculture facility along the Penobscot River in Maine, applied for an exemption in 2021 from the State of Maine to allow them to import eyed-eggs from a facility in Iceland. The application for exemption is still under review at this time. Any decision pending this review will be reported on in subsequent NAC reports.

Species (strain, if applicable)	**Number**	**Life Stage**	**Origin [1]**	**Destination [2]**	**Purpose [3]**	**Date**
Rainbow Trout	16,000	Eyed Eggs	Riverence, WA	Maine	Private Ponds, Recreational Fisheries	2021
Rainbow Trout	48,000	Eyed Eggs	Ennis NFH, Mt	Vermont	Private Ponds, Recreational Fisheries	2021

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 Commission Area (between Maine and NB, 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

The U.S. Food and Drug Administration (FDA) continues to make revisions to portions of their 2015 Environmental Assessment (EA) for AquAdvantage Salmon as a result of a federal court ruling in November 2020. The ruling concluded that the FDA failed to analyze the risk of genetically engineered salmon escaping into the wild. AquAdvantage salmon are currently being reared in a land-based RAS facility in Indiana. These are the first GMO animals to be approved for human consumption in the United States. It should be noted that state and federal regulations are in place prohibiting the use of transgenic salmon for grow-out in marine net pens in Maine. More information on AquaAdvantage GE salmon can be found at: AquAdvantage Salmon Fact Sheet | FDA

Addendum: Response to Questions from Canada

1. **Summary of Salmonid disease incidences**

   - **Question:** *Was there any testing of the genetic origin/diversity of the fish used as broodstock in support of a conservation hatchery program?*
   - **Response:** Yes. All broodstock that are brought into the hatchery are genetically screened using microsatellites for both origin and diversity. We are currently working with Ian Bradbury to explore using SNP panels, but that work is still in progress.

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

Regarding the sentence: "Discussions are ongoing with Cooke Aquaculture to investigate the cause of the escape event and, if appropriate, implement standard operating procedures to "eliminate similar escapes in the future".

   - **Question:** *Has any consideration been given to lowering the thresholds of a "reportable escape" to ensure regulators are aware of even less significant escape events and help better address potential causes?*
   - **Response:** At this time we haven't considered lowering the threshold for a reportable escape. Our regulatory process has established a maximum number of farmed fish that can be captured in a GOM DPS river that would require us to revisit the protective measures in place to reduce escapes if those thresholds are exceeded. At this time, those thresholds have not been exceeded. We continue to work with Cooke to review their annual stocking reports and stocking requests to ensure all fish stocked in marine net pens are of North American origin and are genetically marked to enable fish to be traced back to their individual stocking site.

3. **Summary of Salmonid introductions from outside the Commission Area**

   - **Question:** *Regarding the exemption in 2021 from the State of Maine to allow them to import eyed-eggs from a facility in Iceland, is the application for diploid or triploid EU-origin Atlantic salmon?*
   - **Response:** The application from Whole Oceans is for the importation of Atlantic salmon embryos either as a monosex all female stock or as a triploid stock, from Iceland's Stofnfiskur facility.