



Comparing aquaculture regulations around the world

Are governments protecting wild salmon from aquaculture?

Industry effects on wild fish:

Farming salmon in marine-based net pens is a significant threat to wild Atlantic and Pacific salmon (DFO Publication 2014/006). Wild salmon can be affected by parasites like sea-lice that occur at high concentrations in salmon farms. Diseased aquaculture fish can also transfer pathogens to other fish. Breaches of salmon aquaculture sites allow farmed fish to escape and breed with wild Atlantic salmon, altering the genetics of a population. Open net pens also pollute the sea-floor and bays where they exist.

Given wild Atlantic salmon populations are under pressure worldwide, with several populations considered to be endangered or threatened, reduced survival as a result of aquaculture is a serious concern.

The report:

Gardner Pinfold Consultants Inc. have completed a report titled International Regulatory Review to Support Consistent and Improved Management of the Impacts of Sea Cage Salmon Aquaculture. It examines Atlantic salmon aquaculture in the North Atlantic and along the Pacific coast. The goal of the study is to determine whether regulations provide sufficient protection for wild salmon stocks.

The jurisdictions covered in the report are the Canadian provinces of New Brunswick, Nova Scotia, Newfoundland, and British Columbia, as well the state of Maine, and Norway.

Making comparisons:

Gardner Pinfold Consultants Inc. use criteria from the Aquaculture Stewardship Council's (ASC) salmon standard as a benchmark for comparison. The ASC Salmon Standard was created over an eight-year period through a process that involved more than 500 organizations. The participants included salmon farming companies, conservation organizations, seafood buyers, scientists, and government representatives.

This report uses four of the seven principles that make up the ASC Salmon Standard. These apply directly to wild species protection:

Principle 2: Conserve natural habitat, local biodiversity and ecosystem function

Principle 3: Protect the health and genetic integrity of wild populations

Principle 5: Manage disease and parasites in an environmentally responsible manner

Principle 7: Be a good neighbour and conscientious citizen

These four principles contain a total of 11 criteria. For each, the various jurisdictions covered by the report were assigned a mark of *attain, partially attain, or not attain* depending whether the jurisdiction's regulations meet the Aquaculture Stewardship Council's salmon standard.

The results:

No jurisdiction currently has all measures in place to protect wild salmon populations. However, some are performing better than others. Norway and British Columbia have the most advanced regulatory regimes. Maine measured reasonably well against the standard, while New Brunswick and Newfoundland and Labrador struggled, posting 'partially attain' or 'not attain' scores for nine of 11 criteria.

Nova Scotia has recently created new aquaculture regulations that have yet to fully come in to force. The updated rules appear to address concerns related to wild Atlantic salmon, but it's impossible to determine their effectiveness ahead of full implementation.

Jurisdiction findings compared to ASC salmon standard criteria (Source: Gardner Pinfold Consulting Economists Ltd.)

Criterion	NB	NS	NL	BC	Maine	Norway
2.1	Part	Yes	Part	Yes	Part	Yes
2.2	No	No	No	No	Part	Part
2.4	No	Yes	Part	Yes	No	Yes
3.1	Part	Part	Part	Part	Part	Yes
3.3	Yes	Yes	Yes	Yes	Yes	Yes
3.4	Part	Part	Part	Part	Part	Yes
5.1	Part	Part	Part	Part	Part	Part
5.2	Yes	Yes	Yes	Yes	Yes	Yes
5.4	Part	Part	Part	Part	Part	Part
7.1	No	Part	No	Part	Yes	Yes
7.2	Part	Part	Part	Yes	Part	Part

No = lack of equivalent requirement to ASC **Part** = partial match with ASC **Yes** = similar to ASC standard

Criterion 2.1 – Avoid damage to seafloor under cages

Criterion 2.2 – Maintain water quality around site

Criterion 2.4 – Avoid damage to critical habitats and sensitive species

Criterion 3.1 – Protect wild salmon and sea trout

Criterion 3.3 – Prohibit genetically modified salmon

Criterion 3.4 – Prevent escapes

Criterion 5.1 – Manage fish health

Criterion 5.2 – Documenting therapeutic use

Criterion 5.4 – Avoiding disease spread to wild populations

Criterion 7.1 – Meaningful consultation and complaint resolution

Criterion 7.2 – Aboriginal consultations

Recommendations:

Gardner Pinfold Consulting Economists make three general and 10 specific recommendations to diminish the impact of marine-based net pen aquaculture on wild salmon.

General Recommendations:

- 1. Governments should implement consistent high standards federally in Canada and internationally through the international harmonization process.**

(Each Canadian province has different regulations. In British Columbia, a 2009 court decision forced Fisheries and Oceans Canada to assume responsibility for the aquaculture industry. In the rest of Canada, the industry is regulated by provincial authorities. Norway for example has a national Aquaculture Act, so does the United States although most activities are carried out at the state level.)

- 2. Governments should promote and support other technologies, such as closed containment, to separate wild salmon and their environment from the impacts of salmon aquaculture.**
- 3. Canada should consider, in the process of restoring lost protections and including modern safeguards in the Fisheries Act, the inclusion of strengthened provisions for protecting wild salmon from the impacts of salmon aquaculture.**

Specific recommendations:

Introductions and transfers:

Following the lead of the United States and Norway, all regions should require marking of fish so they can be identified after escape events.

Avoid damage to sea floor under cages:

Following the lead of Norway and BC, and NS's plan as part of its new regulations, NL, NB and Maine should fully implement a requirement for robust and credible modeling to predict ecosystem effects on the sea floor.

Maintain water quality around site:

NB, NS and NL and BC should require dissolved oxygen monitoring. Maine should increase sampling frequency and Norway should consistently require sampling of all sites.

Avoid damage to critical habitats and sensitive species:

Following the lead of BC and Norway and NS's plan in implementing its new regulations, NB and Maine should require avoidance of wild salmon rivers, migration routes and important habitat. NL should clarify the extent of its requirement to avoid high conservation value areas and the extent to which this is implemented.

Protect wild salmon and sea trout:

Following the lead of Norway, it is recommended that NB, NL, NS, BC and Maine implement requirements for contributions to collaborative research and environmental enhancement work with NGOs and research institutions and employ area-based sea lice thresholds.

Prevent escapes:

Following the lead of Norway, it is recommended that NB, NS, NL, Maine and BC adopt a policy to move all operators towards a goal of zero escapes and to raise smolts for longer periods in closed systems on land so that less time is spent in marine waters and the potential for escapes is reduced.

All jurisdictions should require improved counting accuracy of all fish produced, from the number that go into cages through to the number marketed, instead of using estimates with considerable uncertainty.

Jurisdictions should require timely sharing of information on escapes within and between adjacent jurisdictions in the same country or with adjacent countries.

Manage fish health:

All jurisdictions should specify limits to viral disease mortality and parasitic sea lice levels and require farm-specific mortality reduction plans.

Avoiding disease and parasite spread to wild populations:

All jurisdictions should require prompt reporting of disease and parasite outbreaks to other operators in a bay/area and to the public. All jurisdictions should entirely align with the requirements of the OIE Animal Health Code. All jurisdictions should implement aggressive measures, such as complete culling of a diseased farm pen and increased monitoring of adjacent pens.

Meaningful consultation and complaint resolution:

Following the lead of Maine and Norway, meaningful consultation requirements and information sharing with the public should be implemented in NB and NL. BC should move from partial to full implementation. NS should follow through on plans to implement these requirements.

Aboriginal consultation:

Following the lead of British Columbia, it is recommended that NB, NL and NS make progress in implementing Aboriginal Aquaculture protocol agreements and Norway should specify requirements for public consultation that offer Aboriginal communities access to the process.