

# Regulating and Monitoring British Columbia's Marine Finfish Aquaculture Facilities 2019



**AQUACULTURE  
MANAGEMENT**



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

**Canada**



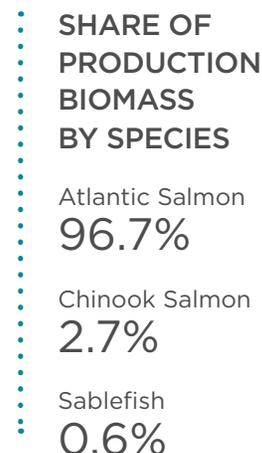
# Marine Finfish Aquaculture in BC

## LOCATIONS OF MARINE FINFISH AQUACULTURE FACILITIES

Marine finfish aquaculture facilities are mainly located around northern and western [Vancouver Island](#). There are clusters of sites in several areas, such as [Clayoquot Sound](#), the [Port Hardy](#) area, the [Broughton Archipelago](#), and the [Discovery Islands](#). All marine finfish aquaculture facilities with a valid licence as of December 31, 2019 are shown in the map on the following page.

## MARINE FINFISH SPECIES CULTIVATED IN BC

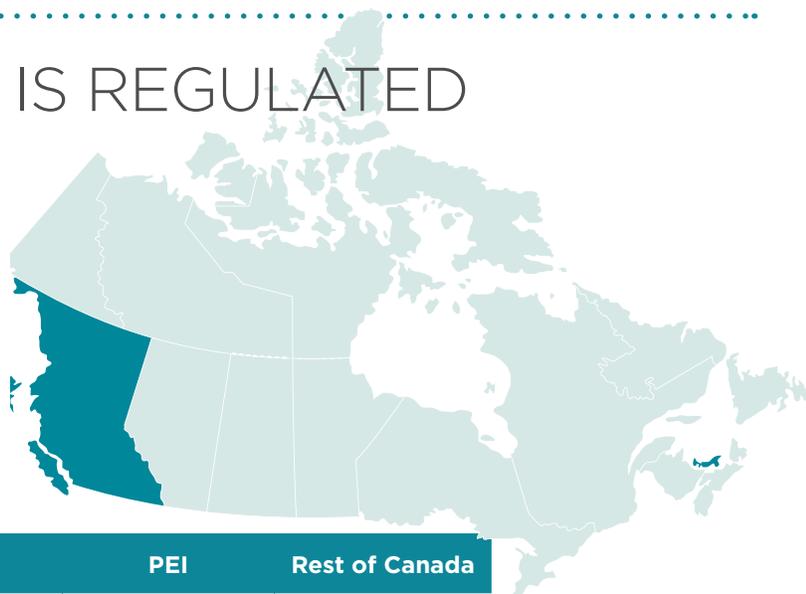
Most marine finfish aquaculture licences are issued for salmon, with Atlantic salmon (*Salmo salar*) and Chinook salmon (*Oncorhynchus tshawytscha*) being the most commonly farmed fish in BC. Some other species, such as sablefish (*Anoplopoma fimbria*), are also cultivated on a smaller scale. Atlantic salmon is the preferred species for cold water marine finfish cultivation around the world because these fish feed well on pellets, are efficient at converting food to body mass, grow quickly, and are well adapted to the confines of a net pen.



## HOW FISH FARMING IS REGULATED IN CANADA

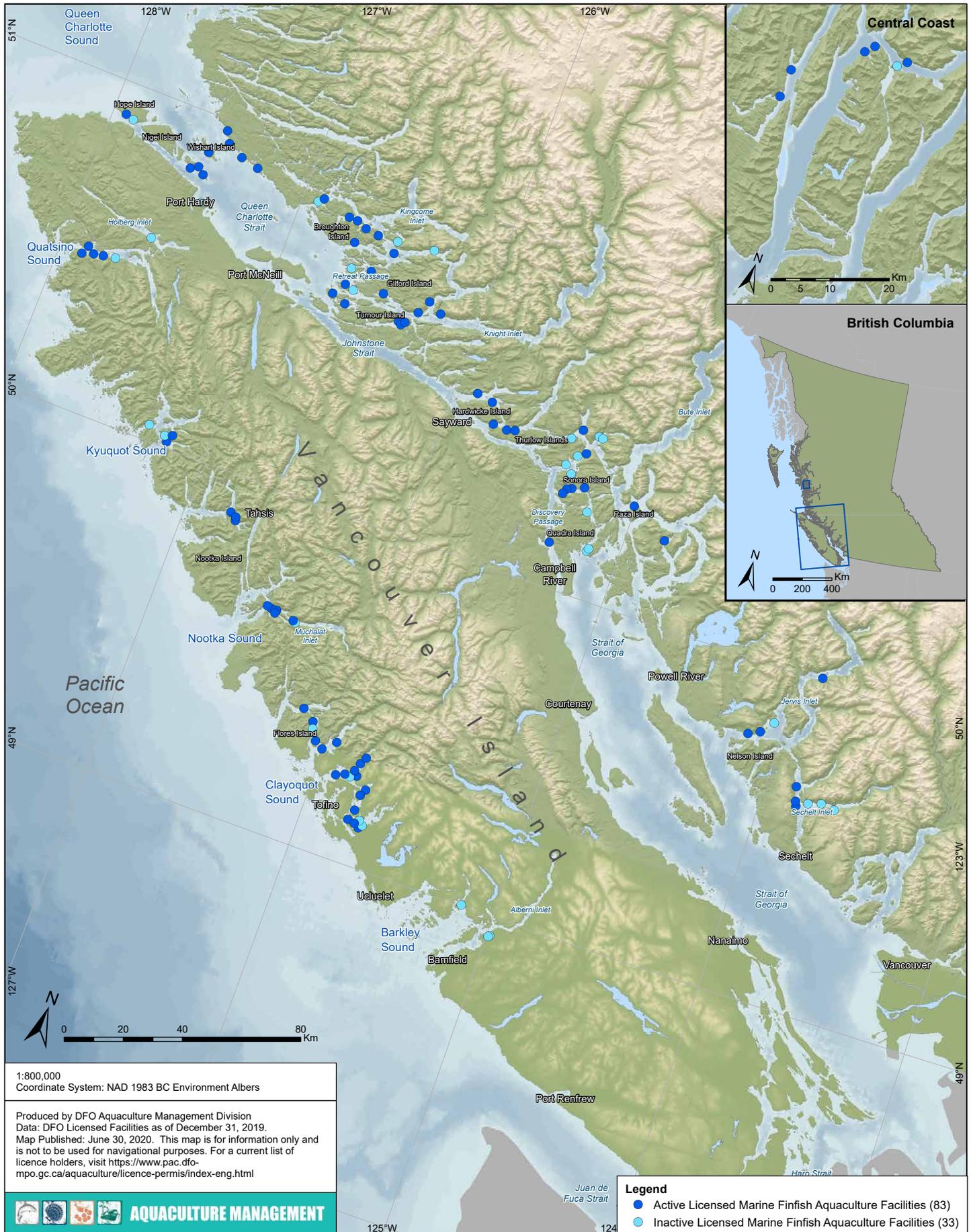
Fish farming is jointly managed between federal, provincial and territorial governments. How it's managed varies across provinces and territories.

Across Canada, fish farming is managed sustainably under the *Fisheries Act*. Federal partners work together to make sure fish are healthy and safe to eat.



	BC	PEI	Rest of Canada
<b>Site Approval</b>	Shared	Shared	Provincial
<b>Land Management</b>	Provincial	Federal	Provincial
<b>Day-to-day Operations &amp; Oversight</b>	Federal	Federal	Provincial
<b>Introductions &amp; Transfers</b>	Shared	Shared	Shared
<b>Drugs &amp; Pesticide Approvals</b>	Shared	Shared	Shared
<b>Food Safety</b>	Federal	Federal	Federal

2019 Active and Inactive Marine Finfish Aquaculture Sites in British Columbia



1:800,000  
Coordinate System: NAD 1983 BC Environment Albers

Produced by DFO Aquaculture Management Division  
Data: DFO Licensed Facilities as of December 31, 2019.  
Map Published: June 30, 2020. This map is for information only and is not to be used for navigational purposes. For a current list of licence holders, visit <https://www.pac.dfo-mpo.gc.ca/aquaculture/licence-permis/index-eng.html>

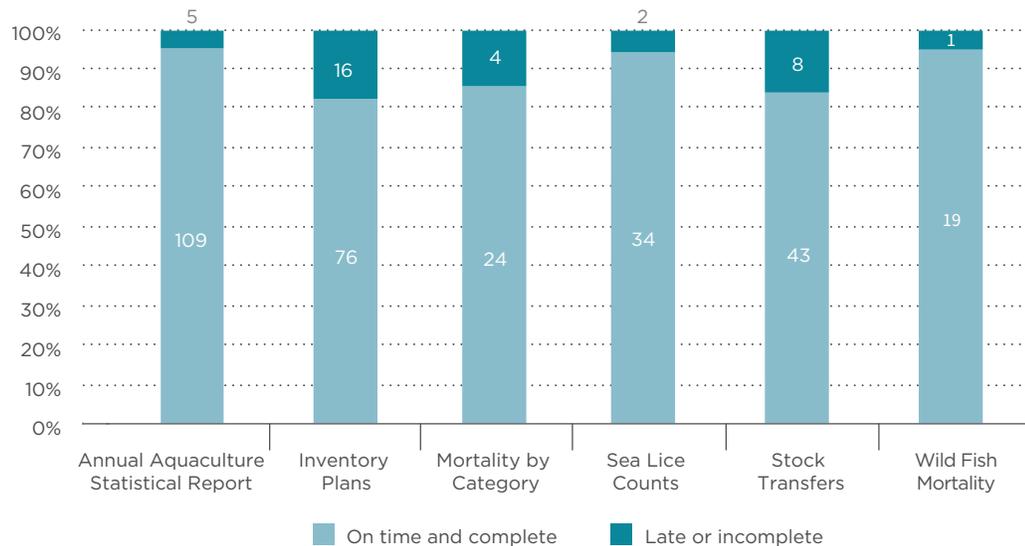


- Legend**
- Active Licensed Marine Finfish Aquaculture Facilities (83)
  - Inactive Licensed Marine Finfish Aquaculture Facilities (33)

# Reporting Requirements

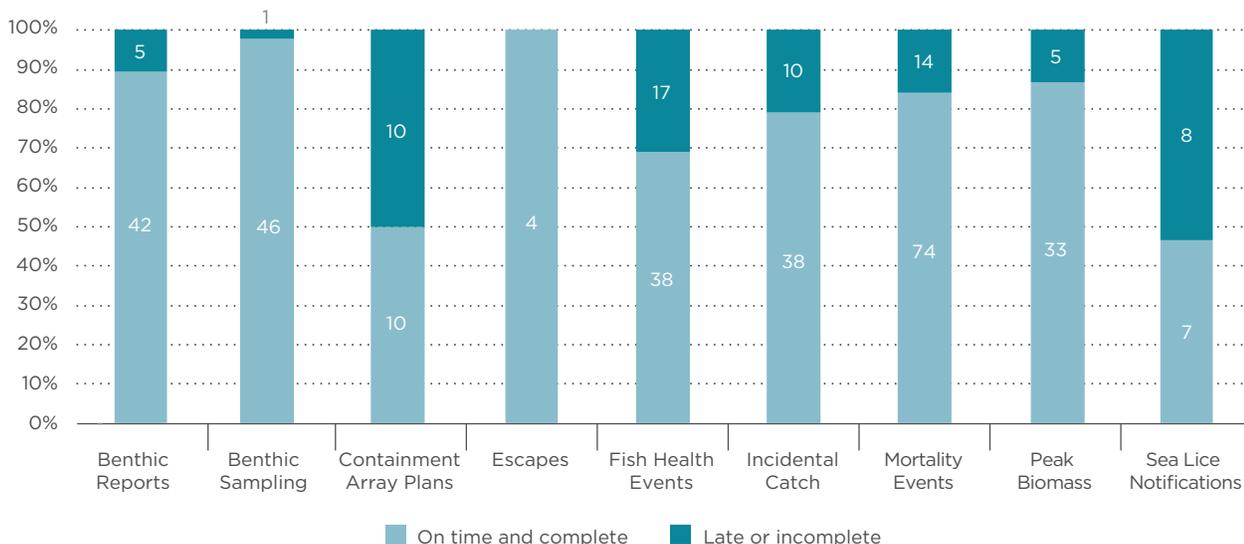
Under the *Pacific Aquaculture Regulations* and the *Aquaculture Activities Regulations*, licence holders are required to submit reports to Fisheries and Oceans Canada (DFO) that fall into two broad categories: scheduled reports and event-based reports. All reports are reviewed by DFO to validate content, to ensure that they contain all elements required by the licence conditions, and to determine if they were submitted on time. When a report contains only minor administrative omissions or errors and the licence holder corrects these in a timely manner, the reports may be considered complete and on time.

## 2019 Scheduled Reports Submitted to DFO



“Wild fish mortality” in **Scheduled Reporting** (left) refers to wild fish caught when collecting farmed fish mortalities. “Incidental catch” in **Event-based Reporting** (below) refers to wild fish caught during transfer or harvest.

## 2019 Event-based Reports Submitted to DFO





## MONITORING AND AUDITS

# What Happens During a Fish Health Audit?

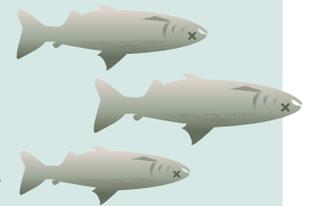
DFO requires operators of marine salmon farms to follow strict measures to keep fish healthy and conducts routine, random site inspections to ensure compliance.

In BC, farm operators must follow a DFO-approved [Health Management Plan](#) (HMP). This plan outlines how the farm will manage biosecurity, water quality, medication treatment, and other measures to maximize fish health. Industry must monitor the health of their fish and report their findings to DFO.

1

### SAMPLING AND OBSERVATION

A team of 2 or 3 DFO biologists spend about 4 hours on each site. Auditors observe fish in each pen, noting any behaviour or signs that might indicate poor health, such as slow or abnormal swimming or visible abnormalities. They then select up to 10 recently deceased fish (called “silvers”) for sampling.



2

### TISSUE COLLECTION

Tissue samples are taken on site and then sent to a laboratory accredited by the Standards Council of Canada and the American Association of Veterinary Laboratory Diagnosticians.

3

### LAB ANALYSIS

The lab analyzes samples for specific bacteria and viruses, and health conditions of concern, including infectious salmon anaemia virus (ISA), Infectious Hematopoietic Necrosis virus (IHNV), and heart and skeletal muscle inflammation (HSMI).



4

### REVIEW AND PUBLISH RESULTS

Results are reviewed by DFO veterinarians and reported on DFO’s website at: [www.dfo-mpo.gc.ca/aquaculture/protect-protege/reduce-disease-reduire-maladie-eng.html](http://www.dfo-mpo.gc.ca/aquaculture/protect-protege/reduce-disease-reduire-maladie-eng.html)

!

**Certain serious infectious diseases, such as ISA and IHNV, are listed under the *Health of Animals Act*. If found, they must be reported immediately to the Canadian Food Inspection Agency, which investigates and develops a plan to prevent the disease from spreading.**

# HOW DFO INSPECTS FISH HEALTH AT BC AQUACULTURE SITES



Auditors use a checklist of 60 items to ensure a farm is operating as licensed and following its HMP. Any deficiencies are noted and reviewed with the farm operator so that improvements can be made. Non-compliance with the HMP may result in further investigation and possible charges.



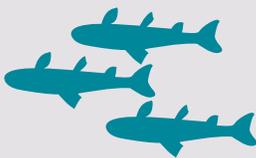
**FISH BEHAVIOUR AND HEALTH**  
are monitored



**WATER QUALITY**  
is monitored routinely and can be addressed if needed



**BIOSECURITY PROTOCOLS**  
such as equipment disinfection, visitor restriction and the use of footbaths, are followed



**COLLECTION & CLASSIFICATION**  
of deceased fish is frequent and acceptable

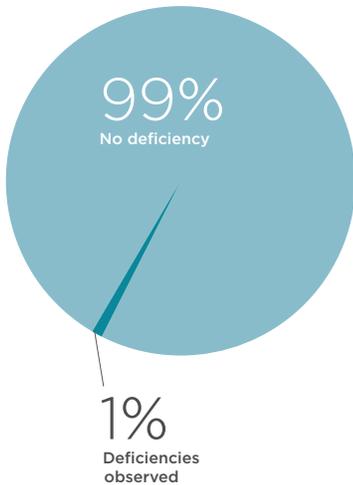


**FEED, NUTRITION & MEDICATION RECORDS**  
are complete and up-to-date

Results are reviewed by DFO veterinarians and reported on DFO's website at:  
[www.dfo-mpo.gc.ca/aquaculture/protect-protege/reduce-disease-reduire-maladie-eng.html](http://www.dfo-mpo.gc.ca/aquaculture/protect-protege/reduce-disease-reduire-maladie-eng.html)

## 2019 DFO FISH HEALTH MANAGEMENT PLAN INSPECTIONS

This figure summarizes the 33 deficiencies observed during Fish Health Management Plan inspections by DFO in 2019. A total of 119 Health Management Plan (HMP) inspections were completed. These deficiencies may not be determined to be “non-compliant”, they just need some corrective actions or improvement.



- Carcass retrieval protocol or record keeping needs improvement (12)
- Current licence was not posted at facility (2)
- Disease contingency or mass mortality information or records needs improvement (1)
- Fish handling, euthanasia protocol or records (1)
- Footbaths or sanitizers needs improvement (2)
- Husbandry or related record keeping needs improvement (2)
- Lice protocol or lice records needs improvement (9)
- Mooring signage needs improvement (2)
- Nutritional or medicated feed protocol concerns (1)
- Transfer records are not complete or up-to-date (1)

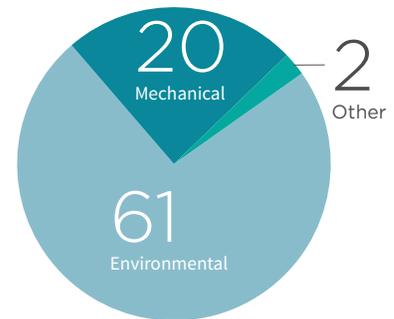
## INDUSTRY REPORTED EVENTS

Fish Health and Mortality Events are reported by industry when they occur, as well as any mitigation or treatment response. DFO reviews whether the conclusions are reasonable and assesses the response against the HMPs and Standard Operating Procedures for the farm site. If there are concerns with the report or event, DFO will attempt to resolve the issue by engaging with the industry veterinarians and, if necessary, will prioritize the facility for a targeted audit.

### 2019 Mortality Events

This figure summarizes Mortality Events as reported by industry for active facilities in 2019.

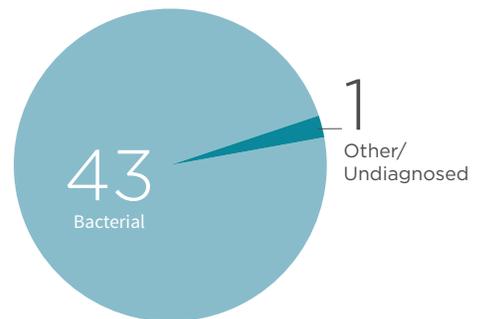
A Mortality Event occurs if the amount of dead fish at a marine finfish aquaculture facility exceeds thresholds outlined in conditions of licence. Environmental events include mortalities caused by naturally occurring conditions such as harmful algae blooms or low oxygen. Mechanical events describe mortalities resulting from stressful procedures such as transport, harvest or treatments.

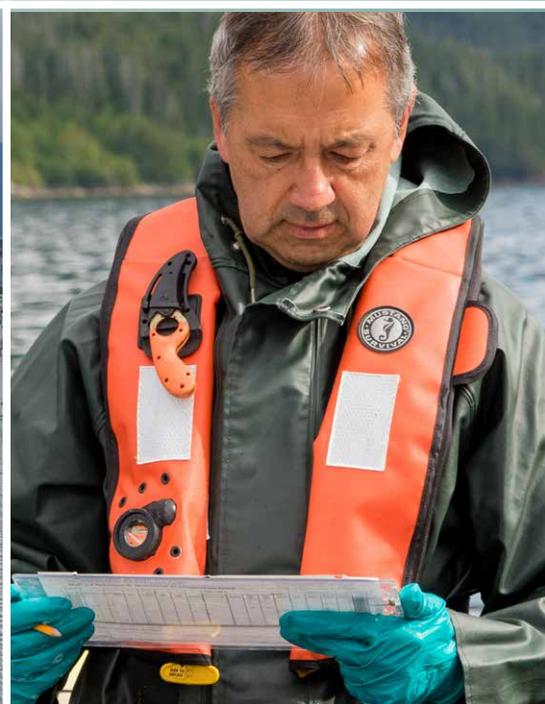


### 2019 Fish Health Events

This figure summarizes Fish Health Events as reported by industry for active facilities.

A Fish Health Event is any suspected or active disease that occurs within an aquaculture facility that requires the involvement of a veterinarian and warrants mitigation measures. Bacterial events are the result of easily treatable diseases caused by naturally occurring bacteria.





## MONITORING AND AUDITS

# Fish Health

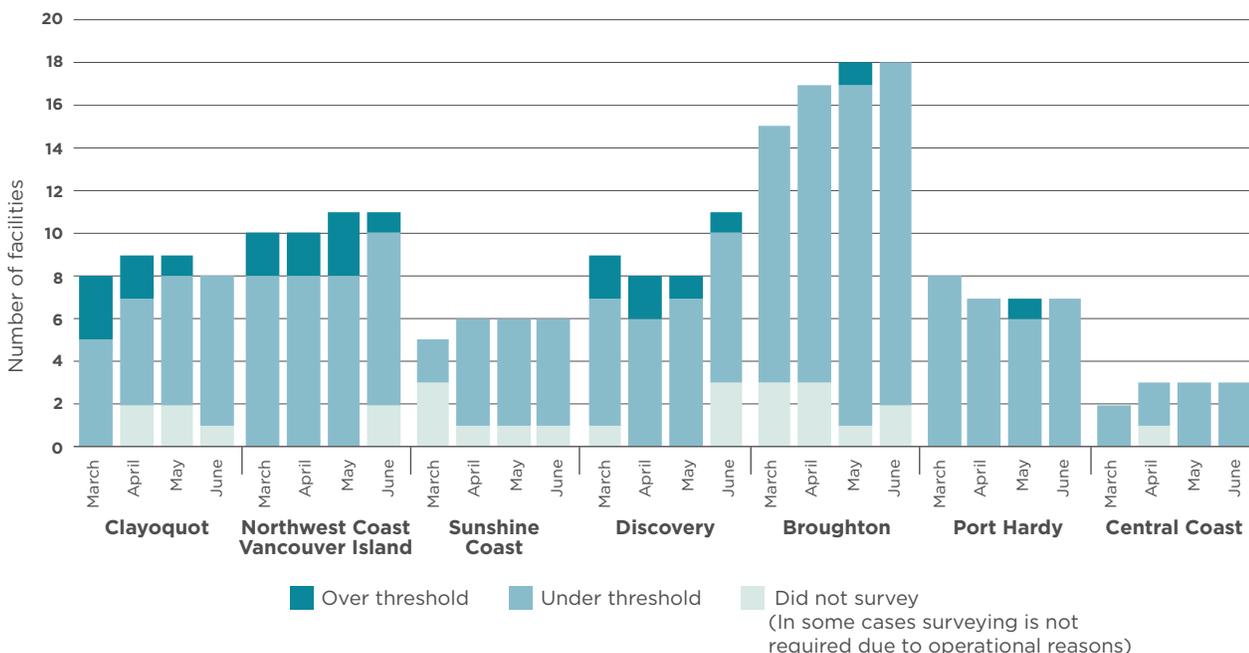
### SEA LICE

Minimizing sea lice levels on farms is a critical component of sustainable aquaculture management. DFO manages this through mandatory monitoring, mitigation, treatment and reporting, as well as audits/inspections to ensure compliance. DFO assesses sea lice abundance on farmed salmon and verifies the accuracy of industry submitted data. This provides DFO with timely information regarding the operational performance and compliance of aquaculture facilities.

Licence holders must count sea lice at active Atlantic salmon facilities throughout the year. Counting sea lice occurs monthly from July to February, and every two weeks from March 1 to June 30 when wild salmon smolts out-migrate. The licence holder must report to DFO within seven days if the average number of motile *Lepeophtheirus salmonis* (a species of sea lice) exceeds three sea lice per fish during the wild salmon outmigration period.

Sea lice abundance exceedances over the threshold have been relatively infrequent since 2011. Recently, there have been some areas where sea lice threshold exceedances have become more common. In response to this, as part of an adaptive management approach, DFO is examining its current sea lice Conditions of Licence (COL) with a view to changing the conditions in 2020 prior to the wild salmon outmigration window. These proposed changes intend to create greater enforceability and clarity, and require additional monitoring and reporting throughout the year. A number of additional enhancements to COLs are being considered for 2022 to advance Area-based Aquaculture Management (ABAM) in consultation with First Nations, industry, and environmental non-governmental organizations.

### 2019 Sea Lice Over Threshold by Area

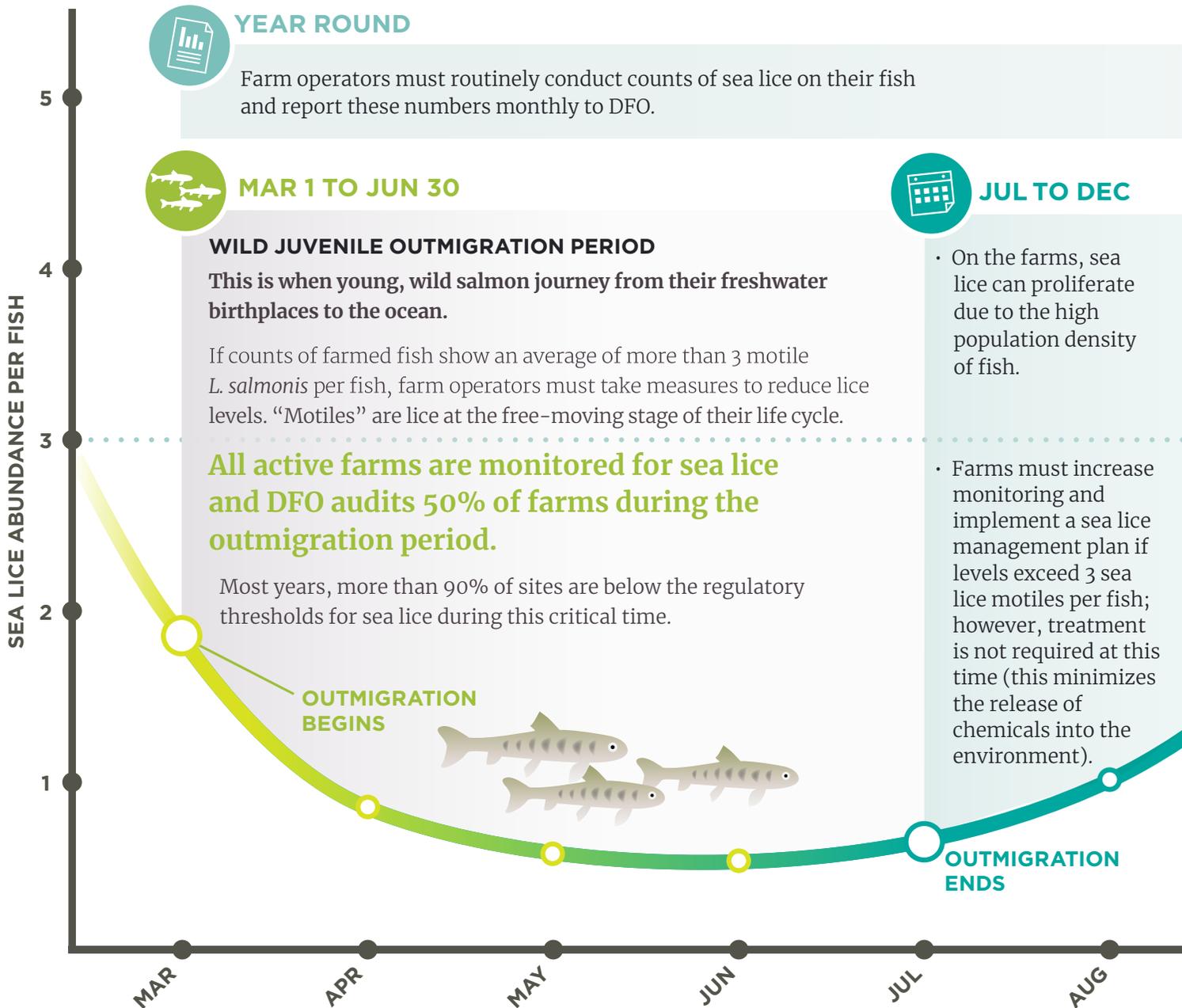


# SEA LICE MANAGEMENT AT BC SALMON FARMS

## WHAT ARE SEA LICE?

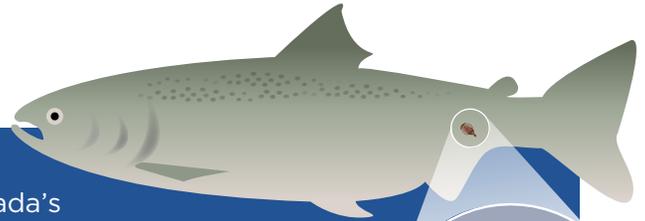
Sea lice are parasites that have lived in BC's coastal waters for thousands of years. Farmed fish are free of sea lice when they enter the ocean but can pick them up in the marine environment.

The species of sea lice that most affects wild and farmed salmon is called *Lepeophtheirus salmonis*



Sea lice generally do not harm adult fish, but can harm small juvenile salmon.

Fisheries and Oceans Canada's (DFO's) requirements ensure that lice numbers are lowest during the outmigration period, when wild juvenile salmon are at greatest risk.



Sea lice abundance varies from year to year and is influenced by environmental conditions like ocean salinity and temperature.

- In late summer, wild salmon start to return to their spawning grounds. These wild fish naturally carry sea lice, which they can transfer to farmed salmon. This is why lice levels on farms begin to increase in late summer and peak in early winter.

**SEA LICE TREATMENTS APPLIED**

**UNMANAGED LICE LEVELS**

**3-MOTILE OUTMIGRATION THRESHOLD**



**JANUARY AND FEBRUARY**

DFO conducts sea lice audits to verify the accuracy of industry reporting.



**In 2019 DFO sampled 3,040 Atlantic Salmon during 51 sea lice audits.**

Farms begin taking measures to reduce lice levels, if needed. This can include harvesting or the use of an in-feed or bath treatment approved by Health Canada.

This graph represents lice levels at an average farm during an average year.

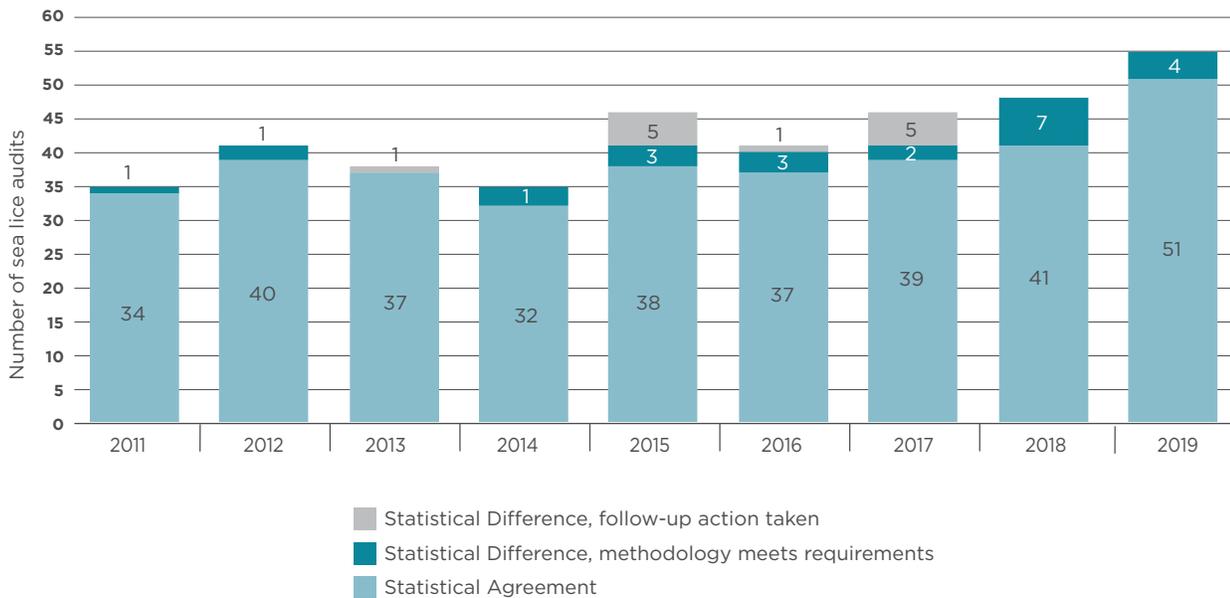
SEP      OCT      NOV      DEC      JAN      FEB

## INTEGRATED PEST MANAGEMENT

SLICE® (*emamectin benzoate*) is a commonly used chemotherapeutant licensed for sea lice management in farmed salmon. In BC, SLICE® resistance has emerged in some farmed Atlantic salmon populations, necessitating the development of alternative treatments for lice management to prevent wide-spread resistance. Having multiple treatment options is a key feature of Integrated Pest Management and involves numerous methods of controlling sea lice in order to reduce reliance on chemotherapeutants, prevent the development of resistance, and to have different tools for different situations. Some other treatment examples include hydrogen peroxide or freshwater baths, mechanical sea lice removal (e.g., using a hydrolicer boat), or simply harvesting all the fish out of the water in a timely fashion.

### DFO Marine Finfish Aquaculture Sea Lice Audits in BC, 2011 to 2019

DFO audits aquaculture facilities to verify the accuracy of industry procedures and reporting. On the day of the sea lice audit, DFO and industry conduct sea lice counts on an equal number of fish. The results of DFO and industry counts are compared to determine statistical agreement. DFO also assesses industry’s counting procedures. In some cases where DFO and industry counts do not agree, the difference may be attributed to sample selection and not methodology. In these cases no follow up action is required. If methodology is incorrect, it is documented by DFO and the company is expected to provide training for their staff.



# MORE ABOUT THE MONITORING AND AUDIT PROCESS



DFO PERFORMS ABOUT **120** FISH HEALTH AUDITS EACH YEAR

ON AVERAGE, THE INDUSTRY COMPLIANCE RATE IS **98%**

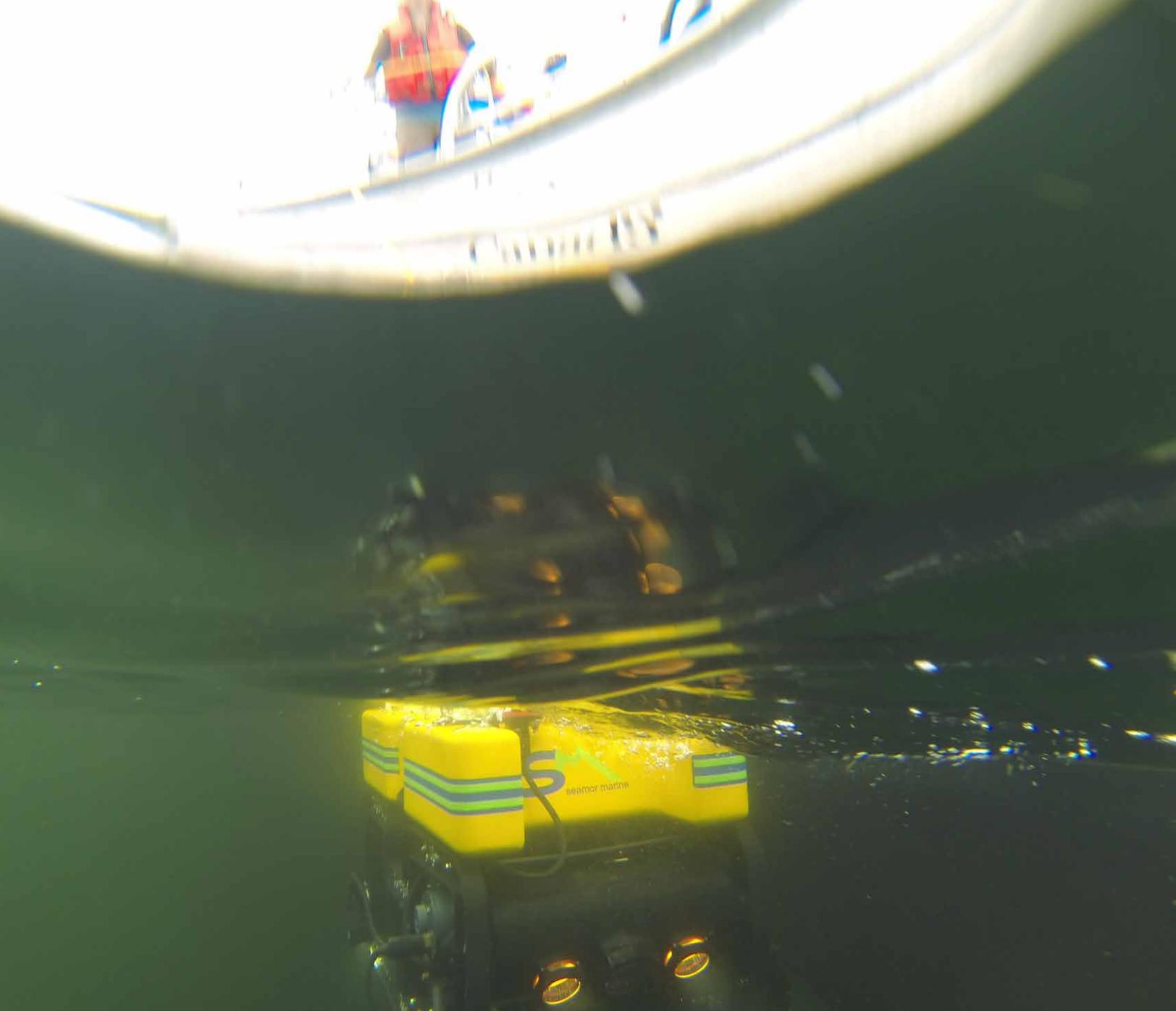


**EVERY 3 MONTHS** DFO RANDOMLY SELECTS 30 ACTIVE\* SALMON FARMS IN BC FOR AUDIT

\*An active farm is one that has had at least three full pens of fish for at least 30 days of a calendar quarter



Learn more at  
[www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.html](http://www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.html)



# Environmental

## WHAT IS BENTHIC (SEABED) MONITORING?

Benthic means “of, or relating to, or occurring at the bottom of a body of water.” In BC, DFO’s comprehensive benthic monitoring, auditing and regulation framework restricts the effects of fish farms on the surrounding environment.

Organic waste from fish farms, including feces and excess food, falls to the sea floor below and around aquaculture sites. In small amounts, this provides food for species living below, but if too much accumulates, organisms can be smothered or the seabed altered. With time, the seabed will recover.

**HOW ARE FARMS MONITORED?**

Under the Aquaculture Activities Regulations, marine finfish aquaculture operators in BC must monitor and submit regular reports to DFO on the benthic impacts of their sites. Results are reported at [www.dfo-mpo.gc.ca/aquaculture/protect-protege/waste-dechets-eng.html](http://www.dfo-mpo.gc.ca/aquaculture/protect-protege/waste-dechets-eng.html).

Farms are monitored at the peak of their production cycle, when they are fully stocked and the fish are fully grown. This is when the greatest impact is likely to occur.

**100% of farms** at peak production (40 to 50 each year) must conduct benthic monitoring and submit results to DFO.

**DFO performs regular audits** to verify industry results and methodology.

**80% to 90% of sites** are below impact thresholds (keep reading to learn more).

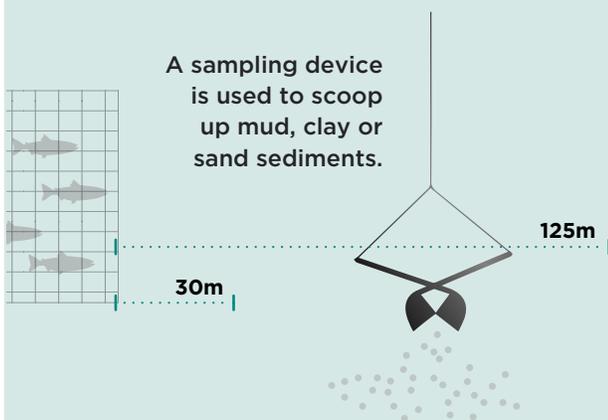
## SOFT AND HARD BOTTOM SITES

Benthic monitoring activities depend on the sea floor beneath the farm. In BC, the sea floor is generally defined as **soft bottom** or **hard bottom**.

These are benthic monitoring procedures that the industry must follow. DFO biologists follow these same procedures during benthic audits:



### SOFT-BOTTOM SITES



Sediment samples are taken at 30 and 125 metres from both sides of the cage edge.

Samples are brought to the surface and analyzed for their level of free sulphides.

A healthy seabed with plenty of oxygen will have low levels of sulphides.

At 30m stations, the threshold is 1300µmol free sulphides.

At 125m stations, the threshold is 700µmol of free sulphides.



### HARD-BOTTOM SITES

Underwater cameras take video of gravel, boulder or bedrock seabeds. The video is reviewed in-office for presence of *Beggiatoa* and opportunistic polychaete complexes (OPCs).



***Beggiatoa* are bacteria that form visible white mats**



**OPCs are organisms that look like orange shag carpeting**

These species can survive where others can't and help break down accumulated waste. Their presence is also an indicator of elevated sulphide levels.

Video of the area from 100 to 124 metres from the cage edge is assessed for impact.

This area is broken into 6 segments. If more than 4 have more than 10% cover of *Beggiatoa* or OPC, the threshold has been exceeded.



**If thresholds are exceeded, the site cannot be restocked with fish until further monitoring shows that sufficient recovery has occurred.**

## INDUSTRY-REPORTED BENTHIC MONITORING EVENTS

### Benthic Monitoring Data

This is a summary of the seabed sampling reports submitted in 2019. 13 site audits were conducted by DFO, and DFO's audits indicated that 100% of results were consistent with industry-submitted reports.

	Industry - below threshold at all stations	Industry - exceeding threshold at one or more station
<b>Hard</b>	7	2
<b>Mixed</b>	4	2
<b>Soft</b>	27	5

## ENVIRONMENTAL REPORTS

### Incidental Catch

Incidental catch are wild fish that are caught or found dead within an aquaculture facility during harvest or transfer of farmed fish. Efforts must be made to release wild fish live and with the least harm. All incidental catch must be recorded and reported to DFO at the end of each production cycle. Complete data for 2019 will not be available until mid-2020 and will be included in the next annual report.

As compared to a percentage of Total Allowable Catch (TAC) in commercial fisheries, the amount of dead incidental catch related to aquaculture in BC is negligible. For example, the 2017 herring incidental catch represents the estimated equivalent less than 0.001% of the commercial TAC for the Strait of Georgia herring fishery.

	2011	2012	2013	2014	2015	2016	2017	2018
<b>Herring</b>	7,833	11,264	23,374	26,128	29,075	45,023	75,240	15,760
<b>Cod Species</b>	290	2,155	2,010	858	13,550	2,501	16,800	1,435
<b>Rockfish Species</b>	1,753	38	2	46	30	1,468	10,250	3,370
<b>Perch Species</b>	1,316	182	129	545	346	736	677	710
<b>Salmon Species</b>	58	89	43	20	58	25	6	11
<b>Other</b>	193	300	260	19	111	3,087	2477	1,199
<b>TOTAL</b>	<b>11,443</b>	<b>14,028</b>	<b>25,818</b>	<b>27,616</b>	<b>43,170</b>	<b>52,840</b>	<b>105,450</b>	<b>22,485</b>

Numbers refer to total individual fish caught

### 2019 Escapes

All reasonable measures must be taken to prevent the escape of farmed fish. If an escape occurs, licence holders must take immediate action to stop further escapes, correct the issue, and report the event. DFO staff perform regular inspections to ensure compliance with Conditions of Licence.

In 2019, the number of escaped fish was higher than normal, mostly due to a single event caused by a fire at a farm site. DFO responded to the event by issuing the local First Nation a scientific licence to conduct a recapture fishery; however, attempts to harvest the escaped fish were unsuccessful. Subsequently, DFO engaged the farm operator and First Nations in the area to develop a coordinated plan to monitor for escapes.



### 2019 Marine Mammal Interactions

All reasonable measures must be taken to prevent marine mammals from coming into conflict with facility infrastructure and farmed fish. Interactions that result in the death of pinnipeds (harbour seals or California sea lions) or any interactions with whales must be reported within 24 hours of discovery. DFO staff perform regular inspections to ensure compliance with licence conditions.

## LOOKING FORWARD

# 2020 and Beyond

Marine finfish aquaculture will continue to evolve in British Columbia as new science, tools, and social values emerge.

## SEA LICE CONDITIONS OF LICENCE

As part of an adaptive management approach, DFO will implement new sea lice Conditions of Licence (COL) in March 2020 to coincide with the wild salmon out-migration window. These are being developed in consultation with First Nations, industry, and environmental non-governmental organizations, and will include new, stricter monitoring and reporting requirements. The new licence conditions will be more precautionary and enforceable. DFO will conduct additional targeted audits to ensure compliance.

## INDIGENOUS AND MULTI-STAKEHOLDER ADVISORY BODY AND TECHNICAL WORKING GROUP PROCESS

In 2019 DFO established an Indigenous and Multi-stakeholder Advisory Body (IMAB) comprised of representatives from the Province of British Columbia (BC), Indigenous communities, environmental organizations, the aquaculture industry, and other key stakeholders. Under the IMAB, three Technical Working Groups (TWGs) were asked to provide recommendations to the Department for the improvement of aquaculture management in B.C. in three main areas: area-based management, alternative production technologies, and fish health. By the summer of 2020, the recommendations to improve aquaculture management in BC developed through the IMAB and the TWGs will be put forward for consideration by the Minister.

## AREA-BASED AQUACULTURE MANAGEMENT

DFO is moving towards an area-based approach for the management of aquaculture. The anticipated outcomes of this transition would include nation to nation collaboration, ecosystem-based planning and management, improved economic benefits for coastal and rural communities, shared accountability, and transparent decision making leading to increased social licence. One example of Area-based Aquaculture Management (ABAM) that was implemented in 2019 is managing the fish health performance of all the farms in an “area” collectively, rather than treating them individually.

## AQUACULTURE ACT

DFO has begun development of a proposed national *Aquaculture Act*. Also proposed is the consolidation and amendment of all aquaculture-related regulatory provisions under the *Fisheries Act*, including those of the *Pacific Aquaculture Regulations* and *Aquaculture Activities Regulations*, into one set of regulations under the proposed act. During the development of the new aquaculture-specific legislation and regulations, the Department will seek to:

- foster national consistency, while respecting federal, provincial, and territorial jurisdiction;
- improve clarity and certainty for the industry;
- enhance environmental protection; and
- help sustainably grow the industry for the benefit of Indigenous and rural communities.

## TRANSITION PLAN FOR OPEN NET-PEN MANDATE

In 2019, the Minister of Fisheries and Oceans was mandated by the Prime Minister to work with the Province of BC and Indigenous communities to create a responsible plan by 2025 to transition open net-pen aquaculture in BC. Over the next 5 years, the Department will advance this commitment, in partnership with the Province of BC and Indigenous groups, by using the best available science, evidence and input to develop a plan for the aquaculture industry in BC that supports the sustainable growth of the industry and also protects the environment.

## RISK ASSESSMENT IN THE DISCOVERY ISLANDS

In 2020, DFO will be completing risk assessments looking at the impacts of marine finfish farms in the Discovery Islands on the health of migrating Fraser river sockeye salmon in response to the 2012 Cohen Commission recommendations. DFO will be consulting with First Nations in the Discovery Islands to discuss the results of risk assessments and aquaculture licences in the area.

## FINFISH CONDITIONS OF LICENCE RENEWAL

Through consultations and working groups created to seek recommendations from Indigenous People and various stakeholders, DFO has heard that Canadians would like to keep developing the ways that aquaculture can be managed in British Columbia. DFO will begin consulting on ways to improve the marine finfish aquaculture licence conditions in 2020, to be implemented when licences are renewed in 2022.



# Important Web Links

## **DFO aquaculture page (National)**

<http://www.dfo-mpo.gc.ca/aquaculture/aquaculture-eng.html>

## **DFO aquaculture page (Pacific Region)**

<http://www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.html>

## **Aquaculture public reporting (national)**

<http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/apr-rpa-reporting-eng.htm>

## **Aquaculture regulations and compliance (Pacific Region-annual compliance report, IGMF, IMAPs)**

<http://www.pac.dfo-mpo.gc.ca/aquaculture/regs-eng.html>

## **Aquaculture licensing (info on user fees, CoLs, report on applications and decisions, siting guidelines)**

<http://www.pac.dfo-mpo.gc.ca/aquaculture/licence-permis/index-eng.html>

## **Aquaculture maps (facility locations, Fish Health zones, transfer zones)**

<http://www.dfo-mpo.gc.ca/aquaculture/bc-cb/maps-cartes-eng.html>

## **CFIA reportable diseases**

<http://www.inspection.gc.ca/animals/aquatic-animals/diseases/eng/1299156296625/1320599059508>

## **MARINE FINFISH AQUACULTURE PUBLIC REPORTING IN BRITISH COLUMBIA**

- 1. Aquaculture Activities Regulations (AAR) Drugs and Pesticides**  
<https://open.canada.ca/data/en/dataset/288b6dc4-16dc-43cc-80a4-2a45b1f93383>
- 2. Monthly mortality by category, by facility (open data)**  
<https://open.canada.ca/data/en/dataset/0a8c5505-ecb3-4d8b-8120-462bd7def6bb>
- 3. Quarterly Average mortality by category, by zone (figure)**  
<http://www.pac.dfo-mpo.gc.ca/aquaculture/reporting-rapports/carcass-health-zone-sante/2017/index-eng.html>
- 4. Fish Health monitoring activities, number of carcasses sampled**  
<https://open.canada.ca/data/en/dataset/4dc95665-3d44-428c-bb26-12f981c57060>
- 5. Audit activities - fish health, sea lice, benthic (figures)**  
<http://www.pac.dfo-mpo.gc.ca/aquaculture/reporting-rapports/mer-mar-audit-verif/index-eng.html>
- 6. Fish health events, by facility, 2016-ongoing (open data)**  
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