

# PACIFIC AQUACULTURE REGULATIONS

## Approach to Fish Health

### Foreword

In response to the February 9, 2009 British Columbia Supreme Court decision in *Morton vs. British Columbia (Ministry of Agriculture and Lands)*, the Government of Canada through the Department of Fisheries and Oceans (DFO), has enacted the Pacific Aquaculture Regulations (PAR) under the authority of the *Fisheries Act (R.S.C., 1985, c. F-14)*. The regulations took effect on December 18, 2010, and provide the regulatory framework for the management of aquaculture activities in BC and in particular waters off its coasts.

The purpose of this document is to support the implementation of the new regulatory regime for British Columbia under the PAR. Marine finfish, shellfish and freshwater aquaculture operations now require a federal aquaculture licence in order to operate legally in the province of British Columbia. Pursuant to the PAR, DFO may determine conditions of licence for the range of issues. This approach document supports the development of licence conditions pertaining to fish health.

Under the PAR the Minister may issue licences and specify conditions in an aquaculture licence including (but not limited to): the measures that must be taken to control and monitor the presence of pathogens and pests in the aquaculture facility; the records that must be kept of those measures; and any associated reporting.

### Purpose

This document provides direction on management measures, conditions of licence and the use of management plans and protocols for aquaculture activities related to managing fish health and the potential release of pathogens and pests.

### Scope

As of December 18, 2010, finfish, shellfish and freshwater aquaculture operations within the province will require a federal aquaculture licence issued under the *Fisheries Act*. This includes the following sectors: Enhancement Facilities (hatcheries); Freshwater Aquaculture; Marine Finfish Aquaculture; and Shellfish Aquaculture. Licence conditions enable DFO to tailor specific requirements to each sector.

While broadly applicable to fish health management in all aquaculture facilities, this approach is mainly intended to guide management activities specific to salmonid culture at both marine and freshwater farming locations including hatchery and grow out operations.

## **Context**

The objective of good fish health management is the reduction or elimination of risk factors that can leave fish more susceptible to disease. By identifying these risk factors, operators can take action before negative health effects occur. Factors such as: handling, feeding, anaesthesia, predator interactions, water quality, vaccination, etc, all contribute to the health status of cultured fish stocks. Spread of disease-causing agents and disease impacts can be minimized within and between groups of fish through good hygiene and disinfection practices, limiting fish movements, and by managing disease outbreaks. Therapeutants and other substances used for disease control can play an important role in preventing the spread of disease and in minimizing impacts when disease is present. However, they must be properly administered and monitored to protect the public, the environment and fish. This requires adequate diagnostic support and safe storage, use and handling.

### **Characterizing the Health Status of Fish at a Culture Facility.**

Aquaculture facilities should have in place an information management system (*Fish Health Records*) that provides timely information to identify and assess changes in fish health to support informed health management decisions. As well, systematic routine assessment of fish to determine the health status of cultured stocks is necessary to identify issues that may affect trade, the health of site aquaculture stocks, the health of aquaculture stocks at other facilities in the vicinity, or the health of wild stocks (*Monitoring Disease and Infection*).

### **Identifying and Managing Risks to Fish Health.**

The use of measures to monitor and assess health status will aid in identifying risk factors both generic to marine finfish aquaculture and specific to site conditions (e.g., *Water Quality, Plankton, Pests, Disease Agents, Stressors, etc*). Once risk factors are identified, Aquaculturists can put in place measures to minimise their effect on fish health and their role in predisposing fish to disease.

### **Reducing Exposure to, or Spread of, Disease-Causing Agents.**

Proactive measures should be implemented to minimize the exposure of fish to stressors and disease-causing agents, and to restrict the spread of pathogens and/or disease from facilities where they are already present. The use of vaccines and screening diagnostics plays an important role in fish health management by preventing disease agents present in the rearing environment from causing outbreaks and/or negative health effects. Drugs, pest treatments, and disinfectants are all tools which can be used to manage fish health. With their use comes the need for proper administration and monitoring in order to protect the public, environment and fish.

## Approach

### Keeping Fish Healthy

Fish held at culture facilities must be provided with a healthy and appropriate rearing environment. This includes the provision of adequate physical space, water temperatures within the normal range for the species held, and adequate water quality characteristics (oxygenation, pH, salinity, concentration of wastes, etc). Licence holders are encouraged to maintain fish at densities that minimize stress to the species of fish being held, recognizing that this density may vary by species.

All efforts must be made to minimize disease and spread of disease within and between sites. Maintaining a clean environment within the site that addresses the facility's critical control points where pathogens may enter a site or contact fish populations is a key management approach. Typical routes of disease transmission include the following: movement of sick fish on-site; movement of wild fish; movement of water; movement of equipment around the site; uncollected mortalities; and contact with fish directly or indirectly by personnel, visitors or their gear.

Adequate hygiene and disinfection procedures for personnel and equipment, including mortality collection, help to keep fish healthy and exposed to as few pathogens as possible. Handling of fish at the facility is a critical control point related to keeping fish healthy. Entrance of potential pathogens will be prevented or minimized by an effective biosecurity barrier at each facility. Biosecurity measures apply to all personnel (staff, divers, management), to all visitors, and to all equipment.

Handling increases stress and risks of injury to fish due to crowding, removal from water and other considerations. It also increases the risk of escapes and may result in a higher potential risk of transmission of disease to wild fish populations. Efforts must be made to minimize handling, to have adequate escape prevention measures in place, and to employ appropriate biosecurity measures in place at all times.

Vaccines may be administered at various times during the life cycle of cultured fish to boost immunity to certain infectious diseases. They are part of an integrated fish health management program that should also include disease screening, both of broodstock and of cultured fish prior to transport / harvest. Vaccines are managed under *Food & Drugs Act* and *Canadian Food Inspection Agency Act*. Farmers are expected to administer vaccines according to manufacturer's guidelines, and to store and handle the product per manufacturer's instructions so as to maintain their effectiveness.

In the event that pests or diseases are present in a cultured fish stock, it may be necessary to administer chemotherapeutants to manage the impacts of the pest/pathogen on the fish and to minimize potential adverse farmed vs. wild fish interactions. Any treatment action should be directed by a licensed Aquatic Animal Health Veterinarian and be implemented by staff trained to do so.

## **Monitoring Fish Health**

Monitoring of fish health will support identification of critical control points related to keeping fish healthy and provide information critical to responding to stress events and disease outbreaks. Routine fish health monitoring should include visual assessment of fish daily or at such interval as to permit timely observation of any unusual behaviour, visible lesions or other signs of disease. Routine sampling and examination of fish for disease surveillance purposes may be done as per the Aquaculturist's procedures, upon the instructions of the operator or Veterinarian / fish health professional or at the direction of Fish Health Management. Samples should be taken in a manner that is representative of the population held at the facility.

Monitoring fish health is important when cultured fish are introduced into the marine environment or are intended for release into the wild. Any such transfers must not result in undue harm to wild fish or public health. Determination of the appropriateness of planned stocking or release of enhancement fish is based upon a review of the disease and mortality history of the cohort, recommendations by a qualified fish health professional, the results of any recommended pre-release disease screening, and guidance from regulatory agencies. Additional factors such as the biological/ecological constraints to release for a specific group of fish, the known disease status of wild stocks likely to encounter the released fish and likely progression of the disease or infection of concern must also be considered.

## **Responding to Fish Health Issues**

Vigilant monitoring and early detection are integral to good management of events. A rapid response is essential, but the specific elements of any response will be determined on a case-by-case basis in conjunction with the responsible Veterinarian and/or Fish Health Management.

Fish health events can arise from a number of circumstances and different responses may be appropriate. Non disease-related mortality events such as farm system failures, plankton blooms, sudden and severe decreases in dissolved oxygen levels etc should result in the implementation of an appropriate response plan involving mitigation of physical factors. Disease requiring management actions that include treatment but do not pose an emergency or a serious concern of outbreak will require the submission of a Fish Health Event report. Endemic diseases of serious concern for a potential outbreak in BC, which may require response measures over and above treatment, must be immediately reported as a Fish Health Emergency. Diseases that are of serious concern<sup>1</sup> for outbreak in Canadian waters and are not endemic to BC but require enhanced response measures for control must be immediately reported to CFIA and also to DFO (using a Fish Health Emergency report).

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<sup>1</sup> Refer to Canadian Fish Health Protection Regulations and OIE Lists for reportable diseases

Once an outbreak is determined, all fish on site and potentially fish off site that are epidemiologically linked to affected fish are subject to an intensified monitoring and sampling program. The exact nature of the program is designed in consultation with a veterinarian and designated fish health staff. The program will also include follow up measures to determine the course and cause(s) of the outbreak and to assess whether treatment and/or management measures are being effective.

### **Recording and Reporting Fish Health**

Licence holders must have an information management system in place that provides culturists with timely information to identify and assess changes in fish health to support fish health management decisions. The information system needs to be in place to maintain records for individual groups of fish and to link fish health records to other production records (i.e. feed, environment, transfers). The information captured should include, at a minimum:

- chronological records of disease history and management;
- patterns of morbidity and mortality;
- actions taken to prevent, control and treat disease,
- movements of fish within facility; and
- health risk factors specific to the site or the affected fish group

The information recorded may also be used for regulatory purposes and can be required elements may be specified in greater detail by DFO. Licence holders will report fish health data on a regular basis as required by conditions of licence issued under the Pacific Aquaculture Regulations. If an outbreak of significant disease is diagnosed a fish health emergency report is required without delay. When diseases listed under the *Health of Animals Act* are suspected or diagnosed then the owners of the animals, including fish, are required to follow reporting requirements as described in Act, and any additional measures as may be directed by CFIA or DFO.

### **Management Tools**

#### **Fish Health Management Plan**

To ensure that Aquaculture licence holders are employing good fish health practices, a fish health management plan is required as a condition of licence. This management plan identifies the types of actions and procedures that licence holders must use at a facility to meet fish health requirements under the Pacific Aquaculture Regulations. The required elements of a Fish Health Management Plan may be specified in an appendix to the conditions of licence and/or form part of a Fish Health Management Operational Directive.

### **Related Approaches**

DFO Interim Approach to Managing Sea Lice under the Pacific Aquaculture Regulations

**Definitions**

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