CODE OF CONTAINMENT

FOR

FINFISH AQUACULTURE

IN

NEW BRUNSWICK

2nd Edition
2021

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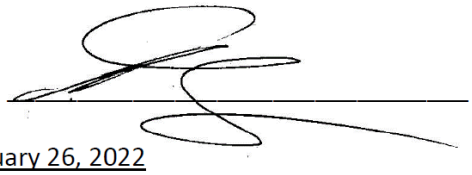
ABOUT THE CODE

This Code of Containment for Finfish Aquaculture in New Brunswick (herein known as "the Code"), 2nd Edition, has been developed by the Science, Policy and Technical Committee (SPTC), approved by the Board of Directors of the Atlantic Canada Fish Farmers Association (ACFFA) on January 20, 2022, and authorized by the Executive Director of the ACFFA as per the signature below.

Signature: 

Date: January 26, 2022

REVISIONS

All revisions will be recorded in the 'Record of Revisions' within this document. All changes to this code will be reviewed and approved by the SPTC and will be recorded in the following table. Revisions may include correcting typographical errors, updates to title(s) and or acronym(s) (ex. NBSGA to ACFFA) content change, and/or updates to policies and practices and/or changes related to regulatory requirements. All revisions will require a full version change (from 2nd Edition to 3rd) and an update to the regulations made under the New Brunswick *Aquaculture Act*. Any version updates are not in effect until referenced in the Regulations.

RECORD OF REVISIONS

Section Revised	Description of Changes Made

1. BACKGROUND

In 2008, the New Brunswick Salmon Grower's Association in collaboration with the New Brunswick Department of Agriculture and Aquaculture and Department of Fisheries and Oceans (DFO) developed a Code of Containment for marine finfish farms in New Brunswick. This Code of Containment had been prepared specifically for Atlantic salmon farming in New Brunswick.

Today, this code has been revised under the same collaborative efforts of the Atlantic Canada Fish Farmers Association (ACFFA) and the New Brunswick Department of Agriculture, Aquaculture and Fisheries (DAAF), to ensure that current updated practices are reflected and that these practices are in alignment with the New Brunswick *Aquaculture Act* and its regulations.

In developing this Code, examples prepared for other jurisdictions including Norway, Scotland, British Columbia, State of Maine USA, Nova Scotia and Newfoundland and Labrador were reviewed to ensure that best practices from elsewhere were considered in this revision of New Brunswick's Code.

The *Code of Containment* for New Brunswick has been informed by the North Atlantic Salmon Conservation Organization's (NASCO) resolution regarding the need to minimize farmed salmon escapes and to establish design standards for finfish cage systems. Further, it is intended that New Brunswick's Code be consistent, in so far as possible, with those of other neighbouring jurisdictions. This Code of Containment will also assist ACFFA members and industry, in general, in their ability to meet international commitments to environmental stewardship.

2. PRINCIPLES

It is recognized by farming companies that it is to their advantage to ensure their stocks of salmon are contained within structures which are properly designed and constructed to meet the anticipated rigours of the marine environment in which they will be deployed. The Code of Containment is founded on the following principles:

- Farming companies will take appropriate precautions and make every effort to ensure the integrity of the structures they deploy on their sites, and that their stocks of fish are appropriately contained.
- Farming companies will implement precautionary measures to prevent escapes during transfers, counting, grading, harvesting, net cleaning and changing, aquatic animal health treatments and marine cage repositioning.
- Farming areas are characterized by a diversity of sites ranging from the very protected to the very exposed and, as such, containment structures will be designed and constructed with particular attention paid to the site-specific rigours of the marine environment in the location where they will be deployed.
- Even with all reasonable precautions taken in the operation of farms and the design, construction and maintenance of containment structures, unforeseen events such as vandalism, predator attacks, and weather events may result in the loss of fish from marine cages. If such events do occur, contingency plans are required for reporting the breach of containment and for efforts related to recovering lost stocks.

3. ROLES AND RESPONSIBILITIES

The marine grow-out phase of Atlantic salmon farming in New Brunswick is conducted on sites leased from the Crown through leases issued under the *Aquaculture Act*. Given this use of public property resources by private operators, industry, and the Province of New Brunswick each have roles and responsibilities with respect to the Code of Containment. In summary, the respective roles of the parties are:

3.1 LICENCE HOLDERS

- to commit to following and incorporating the provisions of this Code.
- to make every reasonable effort to prevent the loss of fish or breach of containment.
- to report a breach of containment and launch stock recovery actions when appropriate.
- to cooperate with provincial and federal regulators.
- to participate in an annual review of this Code.

3.2 ACFFA

- to assist with coordination of storage and access of stock recovery gear.
- to promote and support innovative research and development initiatives directed at improving containment technology.
- to coordinate annual reviews of the Code.

3.3 DAAF

- to utilize existing regulations and licence approval processes to monitor and enforce those provisions of the Code which intersect with DAAF regulatory responsibilities.
- to provide timely responses to industry in the event of a reported breach of containment.
- to provide and update DAAF contact information (names and telephone numbers) for reporting in the event of a breach of containment.
- to coordinate requirements from other regulatory agencies as it relates to protection of fish and fish habitat.

4. SPECIFIC CONDITIONS OF OPERATING PERMITS

Commercial aquaculture licences are subject to the provisions of the *Aquaculture Act* and regulations made pursuant to it. A containment breach is defined as the escape believed to be 50 fish or more and is defined as a reportable condition under the Regulations. The regulations incorporate this Code as a requirement.

5. ESCAPE PREVENTION

Depending on their location, marine cage sites in New Brunswick experience a broad range of tidal currents, wave action, storm surges, and wind exposure. This continuum from low energy protected sites to high energy exposed sites translates into varying requirements in terms of robustness of marine cage materials and construction methods required to endure the rigours imposed by the surrounding environment. The quality of materials, as well as construction standards and methods utilized by manufacturers and suppliers to the industry, together with their level of staff supervision and overall previous experience, are all key elements in ensuring the integrity of containment structures. The combined experience and knowledge of site operators, professional engineers and reputable equipment manufacturers and suppliers represents the optimal resource for determining the equipment requirements for any given site. Ultimately, however, the responsibility for equipment selection and installation procedures resides with the site operator.

5.1 MOORING SYSTEMS

The mooring system consists of a variety of components such as anchor blocks, mooring chain, bridals, grid plates among others that ensure the structural and positional integrity of a marine farm (**Fig. 1**). Environmental conditions, specifically wind exposure, maximum significant wave height as well as current speed and historical information can dictate the energy of the site and thus establish the criteria for design and construction of marine cages and moorings to prevent escapes.

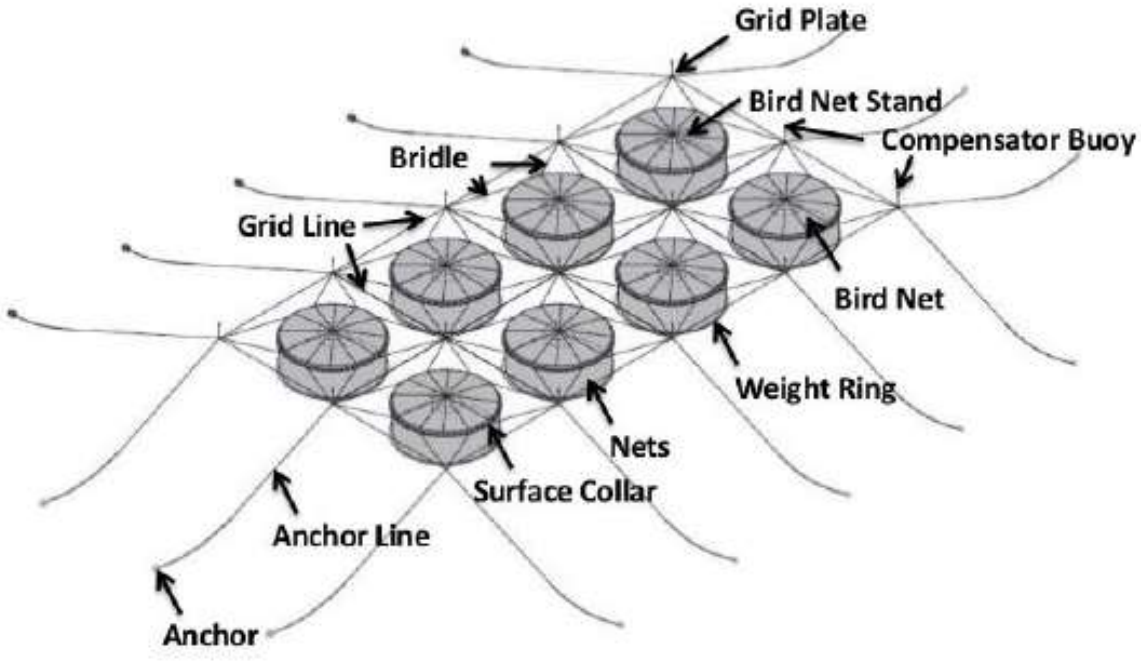


Figure 1. System components of a typical marine farm in New Brunswick.[1]

From 12 months following the implementation of the Code, operators require new or rebuilt marine cage installations to be designed and drawings supplied by a Professional Engineer. In the design process for marine cage aquaculture site installations, Professional Engineers should utilize the following standards for technical guidance in developing the technical specifications for a marine cage facility:

- Standards Norge, "*NS 9415:2009 – Marine fish farms: Requirements for site survey, risk analyses, design, dimensioning, production, installation and operation" Marine fish farms: Requirements for site survey, risk analyses, design, dimensioning, production, installation and operation*.", 1st Edition, November 10, 2009.
- Marine Scotland, *"A Technical Standard for Scottish Finfish Aquaculture"*, June 2015.
- International Organization for Standardization, "*ISO16488 – International Standard: Marine fish farms – open net cage – design and operation*", 1st Edition, July 2015.
- American Petroleum Institute, *"API RP 2SK – Design and Analysis of Stationkeeping Systems for Floating Structures"*, 3rd Edition, October 2005.

[1] Bridger, C.J., Fredriksson, D.W., and Jensen, Ø. 2015. Physical containment approaches to mitigate potential escape of European-origin Atlantic salmon in south coast Newfoundland aquaculture operations. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/072. vi + 54 p.

The use of mooring analysis for many commercial offshore activities, such as aquaculture, renewable energy, and oil & gas has been steadily increasing over the past several decades. Currently there exists several commercial software packages that Professional Engineers can use to assess the response of fish farms and other offshore mooring systems in various environmental conditions, including:

- ProteusDS, developed by Dynamic Systems Analysis (Canada)
- AquaSim, developed by Aquastructures (Norway)
- OrcaFlex, developed by Orcina (UK)

These software packages are widely accepted, validated and developers have spent significant efforts calibrating model performance to physical measurements in lab settings. To safely design a mooring system to withstand extreme storm events over its lifecycle, the long term extreme environmental conditions must first be accurately determined. Engineering standards, while sometimes varying in specific requirements, typically require mooring analysis be carried out with 1-in-50-year or 1-in-100-year environmental conditions, meaning these types of conditions would only occur once every 50 or 100 years.

Any properly engineered design includes an assessment of "accidental" conditions to ensure the design can remain operational under unforeseen circumstances. Mooring analysis can assess the loading and response of a fish farm when individual lines or components experience a break. The importance of this is to show that the system will not completely break down under the loss of a single integral component, and that the system has significant redundancy built in.

Engineering standards also require the use of safety factors, which provides a cushion between the expected forces on a particular component and the strength of said component. Safety factors allow for systems to intentionally be designed stronger than needed for normal usage to allow for unexpected loads, operational errors, or degradation. The use of approved safety factors from accepted engineering standards greatly reduces the operational risk of a marine cage farm.

5.2 NET STRUCTURES

Nets utilized in marine farm applications serve two purposes: containment and deterrence. Containment nets are those where finfish populations inhabit and are constructed in a smolt and market net mesh. The mesh size used may vary with the material used, method of construction and manufacturers. Operators are responsible to ensure that any nets used, follow the mesh size requirements (**Table 1**) in relation to fish size.

Table 1. Maximum mesh size in relation to minimum fish size based on current industry knowledge.

Maximum Inside Mesh Size (inches)	Maximum Inside Mesh Size (mm)	Minimum Average Fish Size
1 – 3/8	30	50 g
1 – ½	38	60 g
2 – ¼	57	300 g

Deterrence nets are generally divided into two categories: predator and bird. Predator nets are installed below the surface of the water and are intended to deter predators such as seals from entering cages. Conversely, bird nets are installed above water and are intended to deter and protect the fish populations from predation or damage from birds.

Nets provide the basic barrier for containment; as such, close attention needs to be paid to ensure they are properly constructed, installed, and maintained. Accordingly, the following will be taken into consideration:

- All netting materials used will be of known composition and strength.
- The mesh of any part of the containment net in the marine cage, including any repairs, must meet the minimum breaking strength standards established in Table 2.
- Marine cages will be monitored on a daily basis for floating debris which could cause damage to netting.
- Nets will be installed in such a manner that the strain is borne by the main structural components of the system, not ancillary structures such as handrails.

5.3 NET INVENTORY MANAGEMENT

- Cleaned/repaired nets stored on dry land will be stored in a manner that prevents exposure to ultraviolet light.
- All nets are to be marked with an inventory control number.
- Maintenance/repair records will be maintained for each net used.
- Materials used in the manufacture of marine cage components will be of known composition and strength.
- Materials and construction specifications will be documented.
- Operators shall maintain records of all nets including new net purchases, removal of old nets, testing records, repair records, as well as installs and removals.
- Any containment nets and predator nets that are in storage for more than 6 months shall not be deployed unless a visual quality control check is completed to ensure the net has maintained integrity.

5.4 BREAK STRENGTH TESTING

A newly manufactured net does not require break strength testing if the manufacturer performs testing during construction as per ISO 1806. Break tests are conducted on all nets when they are cleaned and before re-entry to a site. This applies to all netting types currently used by the industry in New Brunswick including traditional nylon and new materials like HDPE (see section 5.4.2).

Samples must be taken from four different locations; jump net (1), top half of the side wall (2), bottom half of the side wall (3) and the bottom of the net (4) (**Fig. 2**). As predator nets DO NOT HAVE a jump net, only three areas are tested, locations 2, 3 and 4. All holes and patches created during testing must be repaired/sewn in prior to re-entry.

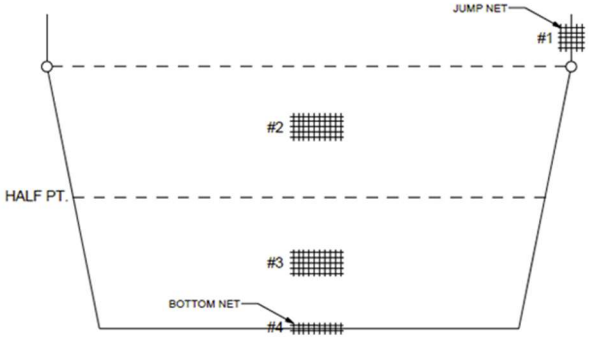


Figure 2. Net sampling locations.

The size of the net determines the break strength classification (**Table 2**). Based on the classification, there are different requirements for net that is above water (#1) than net that is below (#2 - #4) water (**Table 3**). Break tests are measured as 'kilograms of force' (kgf) as outlined in Table 3. A failed net is measured by failures in sampling locations below water. Should samples taken from above water fail, the net may be repaired to meet the strength requirements. Nets that do not pass break tests are to be taken out of service immediately.

Table 2: Net Dimension Classification.

	Circumference						
Depth[a]	≥50m	>50 m, ≤60m	>60m, ≤70m	>70m, ≤80m	>80m, ≤90m	>90m, ≤110m	>110m
≤5m	**A**	**A**	**B**	**C**	**D**	**D**	**E**
>5m, ≤10m	**A**	**A**	**B**	**C**	**D**	**D**	**E**
>10m, ≤15m	**A**	**B**	**B**	**C**	**D**	**D**	**E**
>15m, ≤20m	**B**	**B**	**C**	**D**	**D**	**D**	**E**
>20m, ≤30m	**D**	**D**	**D**	**D**	**D**	**E**	**E**
>30m	**E**	**E**	**E**	**E**	**E**	**E**	**E**

[a] Depth is from waterline rope to net bottom.

Table 3: Net strength per Classification

	Class A (kgf)		**Class B (kgf)**		**Class C (kgf)**		**Class D (kgf)**		**Class E (kgf)**	
Mesh Size	Above Water	Below Water	Above Water	Below Water	Above Water	Below Water	Above Water	Below Water	Above Water	Below Water
>30mm	38	**41**	43	**46**	47	**51**	57	**62**	71	**77**

Bird nets are not subjected to break strength testing. However, the nets are cleaned, repaired, and evaluated between each use and repaired while in-use by marine site employees.

5.4.1 NYLON AND KNOTLESS HDPE NETTING TESTING PARAMETERS

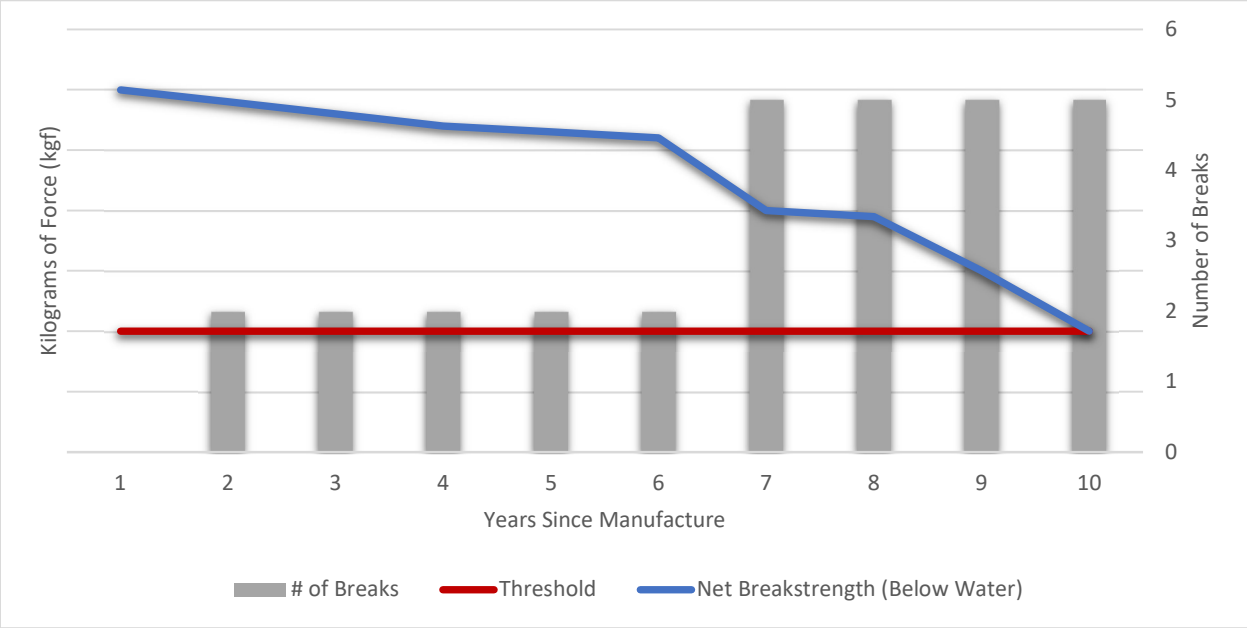
A **minimum of 5 breaks** must be completed for each of the four locations (except predator nets, refer to 5.4) and the average of those breaks used to establish if the net passes of fails the requirement for that section of the net.

5.4.2 ALTERNATIVE NETTING TESTING PARAMTERS

There are a number of alternative nettings available on the market. Currently the industry is using HDPE which is an advancement over the use of nylon netting. It has tremendous abrasion resistance and more than double the resistance to damage and wear as comparted to nylon. Abrasion resistance is critically important. As nets wear and are abraded on the cage structures and/or predator interactions, they became more susceptible to rips and tears under adverse conditions. HDPE nets retain both strength and abrasion resistance for years after deployment. Field tests by manufacturers indicate that after 6 years of deployment, including regular in-situ net cleaning, only a 10% reduction in strength.

To reflect the superior performance of HDPE netting, specifically nets constructed of HDPE Knotted (ex. Sapphire, Sapphire Ultra-Core) are required to conduct a **minimum of 2 breaks** at each of the four locations (excluding predator nets as discussed in 5.4) until after 6 years of manufacture, after which point the minimum number of breaks will increase to 5 (**Chart 1**). The reduction in breaks meet the intent of the Code while also maintain the integrity of the net.

Chart 1. Theoretical lifespan of HDPE Knotted mesh over time with increased break strength testing.



As industry knowledge is gained on the lifespan of alternative netting, reviews of performance and/or the Code are completed, testing parameters may be adjusted. As other new materials become available and used by the industry in New Brunswick, the Code will be updated.

5.4.3 TEST RESULTS

Break strength test results shall be for each net and traceable to the net tested. Records of break strength testing shall include, at minimum:

a. Owner of net and net identification number
b. Mesh manufacturer and manufacturer's published mesh-breaking strength
c. Net fabricator and date of net fabrication
d. Accumulated in-water service time
e. Size and gauge of mesh and dimensions of the net
f. Date and location of testing, company and name of person doing test
g. Information on antifoulant treatment, if any
h. Whether net was tested wet or dry
i. Approximate ambient temperature at test
j. Breaking strength test results for each location and pass/fail grades
k. General comments and notes on overall condition of net
l. Signature of tester

Refer to Appendices.

5.5 SITE INSPECTIONS

Regular repairs and maintenance are performed by the site crew and/or maintenance crew throughout the grow-out. Each day, employees perform routine maintenance from the surface such as removing debris, replacing waterlines or handrail ties, inspecting, repairing, and reporting any holes in the net and other activities as required. Upon discovery of broken, chaffed/weak, or missing ropes, cage sections, etc., management is notified, and repairs/replacement/retrieval is coordinated with divers, maintenance vessel, or plastic welding, as necessary. Nets, cages, and anchoring systems shall be inspected following a storm event or if damage is suspected.

Accordingly, the Code addresses the following inspections:

- *Initial Inspection*: All elements of the marine cage, mooring and netting structures will be inspected to ensure they are properly installed in accordance with engineer certified design specifications. Inspectors will also compare prepared specifications of materials and construction methods to those used in establishing the site. The results of the initial inspection will be documented for the installer and will include a description of the installation, details of design, description of work carried out, findings and recommendations.
- *Weekly Surface:* Formally monitor and inspect surface components of mooring systems, cages, nets and ropes on each site once per week and record the inspection.
- *Monthly Inspections*: Inspections of sub surface nets and components will be carried out with the results to be recorded, signed by the operator, dated, and kept on file to be reviewed during an audit, or by regulatory official inspections.
- *Post Storm Event*: Additional inspections as required will be carried out immediately following a major storm event, with results documented.
- *Annual:* Inspect components of the mooring system, marine cage structures, netting, predator control systems, and site markings, with results documented and made available to an inspector upon request.
- *Restocking*: Inspections will be carried out on components of the mooring system and marine cage structures, with results documented and made available to an inspector upon request.

5.6 PREDATOR DETERRENCE

Predators can not only harm fish, but their presence can cause stress and damage to containment structures. All precautions will be taken to exclude and deter predators, such as birds, wild marine fish, and mammals from the site. Basic deterrence includes proper storage of morts and garbage, good feed storage and correct installation of containment and deterrence netting.

Each marine cage has the capacity to utilize a three-net system – main, predator and bird nets. Due to abundance of other wildlife during the summer months and decreased oxygen availability, predator nets may be removed. This decision may be company and/or site specific and be based on historical incidents. If a site historically experiences/is experiencing high mortality due to predators, the predator nets should remain on site for the production cycle. Bird nets will be placed on the cages immediately post smolt entry and will remain on the cage for the duration of the production cycle, only being removed as necessary for sea lice treatments and harvesting.

Damage to nets by predators is a potential means of stock loss. Accordingly, operators will have considered and implemented provisions to minimize loss of stock due to predator damage. Such considerations will include, but are not limited to the following:

- The primary containment net will be protected from damage by predators, for example by use of a predator control net as needed.
- The predator net mesh size will be consistent with that utilized in the area for controlling access by predators and will recognize that not all sites are habitually prone to predator attacks.
- Provision will be made to avoid bird predation with the use of a top bird net.

5.7 VESSEL REQUIREMENTS

All company owned vessels with inboard engines shall have guards installed on the propellers. This feature is not only necessary to prevent damage to nets and equipment, but it also allows the feeding vessels and other service vessels to move easily between the cages. Companies will take reasonable steps to avoid propeller damage by vessels they employ or contract for work on their sites.

5.8 RESTOCKING*:*

Site markings are required to minimize site equipment damage due to vessel traffic. All finfish farms in New Brunswick will be marked with aids to navigation as required by Transport Canada under the provisions of *Canadian Navigable Waters Act* (CNWA) permits and/or as required under the Aquaculture Act regulations. In addition, the CNWA specifies conditions for the maintenance and upkeep of site marking equipment.

5.9 FISH HANDLING PROCEDURES

When fish handling occurs, it takes into consideration the prevention of fish escape. When fish are handled for the purposes of lice counts or weight sampling, harvesting, etc. operating procedures as per farm management plans are implemented to reduce risk of escape. Provisions include the requirement for catch nets during handling.

6. ESCAPE RESPONSES

6.1 KNOWN AND SUSPECT EVENTS

Known events such as hose connection failures, etc. are likely to occur above water and are generally related to human error or equipment failure. These are incidents where generally a known estimated number of fish were accidentally released from the system during a handling event, such as a single fish dropped during lice counts. While these incidents may not meet the established threshold for breach reporting, these are incidents where fish have been physically seen entering the marine environment outside of containment and shall be recorded and reported events.

Suspect events are those where it is uncertain if any fish have escaped but circumstances, such as holes large enough for fish passage are discovered during net inspections, etc., indicate that it is possible that fish may have escaped. In these instances, an initial notification report shall be submitted with follow-up on estimated escape inventory, if any, detailed information, including cause and additional report submission, if required.

6.2 INITIAL RESPONSE

To enable effective response, employees shall be made aware of appropriate response measures and reporting requirements. Operators shall have an escape response plan that dictates escape prevention and response procedures and have available on each active site response equipment that can be utilized by employees and/or divers to enable immediate, temporary repairs. Examples of materials include spare netting, twine, zap straps, and rope. Rope available on site may also be used by site crews to cinch a hole or bring a section of net above the surface of the water.

Operators shall utilize divers or remote operated vehicles (ROV) to inspect the netting and cage structure, as applicable, to determine the extent of damage and to inspect swimming inventory.

6.3 RECAPTURE

Authorization of recapture or a recapture permit may be issued by other regulatory agencies. Even though all required fish losses will be reported, not all escape incidents will trigger recapture efforts; life history, time of year and other parameters will play into the decision making.

7. NOTIFICATION OF ESCAPE EVENTS

7.1 REPORTING REQUIREMENTS:

Within 24 hours after becoming aware of a suspect or known escape event or handling loss of an estimated 50 or more fish, a report shall be made to the Chief Veterinary Officer (CVO) and shall detail the aquaculture licence number (MF), the type of event, the date and time that the event was discovered, the date and time that the event occurred, if known, the presumed cause of the event, if the finfish have potentially escaped from one or multiple cages, if the estimated number of finfish that have escaped is above or below reporting limit and the species and strain of the finfish that have escaped. Refer to Appendices, *NOTIFCATION OF ESCAPE EVENT FORM*.

7.2 OTHER REQUIREMENTS:

An *ESCAPE EVENT DETERMINATION AND MITIGATION FORM* shall be submitted to the CVO within 48 hours of becoming aware of the event and shall contain the aquaculture licence number (MF), the specific location of the cages from which the finfish have escaped including cage identification (i.e., cage number), the cause of the event, an estimated number of finfish that have escaped, and any remediation measures taken/proposed. Any proposed recapture plan must be approved by the appropriate regulatory authority.

7.3 POST INCIDENT REQUIREMENTS:

An *ESCAPE EVENT FINAL REPORT FORM* shall be submitted to the CVO within 14 days after the completion of mitigation measures to address the escape event. The final report shall include the aquaculture licence number (MF), the number of cages from which finfish have escaped, an estimate of the number of finfish that have escaped, the average size of the finfish that have escaped, the species and strain of the finfish that have escaped, the cause of the event, any additional mitigations that are required, and the results of any recapture activities that may have been undertaken. If a system component failure has occurred, further information such as the date of the most recent inspection, including the name of the person who performed the inspection, will be provided.

8. TRAINING

Operators shall ensure that marine farm employees review procedures and equipment at a minimum annually including changes made to the protocols or their requirements and responsibilities under the Code.

9. REVIEWS AND UPDATES

This document will be reviewed annually at a minimum or as necessary to reflect current practices and remain consistent with regulatory requirements.

The annual review will be coordinated with the ACFFA Science, Policy and Technical Committee and the New Brunswick Department of Agriculture, Aquaculture and Fisheries.

A 'Record of Revisions' included in this document will be utilized to record revisions made to the Code.

APPENDICES

A1. Break Strength Testing Form
A2. Notification of Escape Event Form
A3. Escape Event Determination and Mitigation Form
A4. Escape Event Final Report Form

END OF DOCUMENT

A1. Break Strength Testing Form

COMPANY INFO

LICENCE HOLDER	

NET INFORMATION

DATE OF TESTING	**NET ID**	**ACCUMULATED DAYS IN WATER**

MESH MANUFACTURER	**PUBLISHED MESH BREAK STRENGTH**
NET MANUFACTURER	**DATE OF NET FABRICATION**

Type of Net (Circle ONE)	SMOLT MARKET PREDATOR SINGLE GEN
Net Circumference (Circle ONE)	70m 100m 150m Other: _____m
Net Dimensions	

TESTING INFORMATION

LOCATION OF TESTING			
AIR TEMPERATURE	°C	**NET WET OR DRY?**	WET DRY

NOTE: HDPE NETS <6 YEARS OLD ONLY REQUIRE 2 BREAKS - AFTER 6 YEARS, 5 BREAKS ARE REQUIRED
PREDATOR NETS WITH NO JUMP NET BEGIN RECORDING RESULTS AT LOCATION 2

LOCATION 1: **Jump**	LOCATION 2: **Side**	LOCATION 3: **Side**	LOCATION 4: **Bottom**
1. kgf	1. kgf	1. kgf	1. kgf
2. kgf	2. kgf	2. kgf	2. kgf
3. kgf	3. kgf	3. kgf	3. kgf
4. kgf	4. kgf	4. kgf	4. kgf
5. kgf	5. kgf	5. kgf	5. kgf
AVG kgf	AVG kgf	AVG kgf	AVG kgf
PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL

GENERAL COMMENTS & NOTES ON OVERALL CONDITION OF NET	
NAME OF TESTER	**SIGNATURE OF TESTER**

A2. Notification of Escape Event Form

All suspect and known fish losses (outside of containment) that could have resulted in a loss of 50 fish must be reported by the Licence Holder within **24 HOURS OF DISCOVERY OF A SUSPECT OR KNOWN FISH LOSS, VIA EMAIL (CVO_CSV@gnb.ca) to the CHIEF VETERINARY OFFICER FOR THE NEW BRUNSWICK DEPARTMENT OF AGRICULTURE, AQUACULTURE AND FISHERIES**.

COMPANY INFO

LICENCE HOLDER	
AQUCULTULRE LEASE	MF -
SPECIES PRODUCED	

ESCAPE EVENT INFORMATION

DATE OF REPORTING	**TYPE OF ESCAPE INCIDENT, INDICATE ONE**	
DD-MMM-YYYY	SUSPECT LOSS	KNOWN LOSS
DATE & TIME WHEN EVENT WAS DISCOVERED		
DD-MMM-YYYY	:	AM PM
DATE & TIME WHEN EVENT OCCURRED, ESTIMATE IF NOT KNOWN		
DD-MMM-YYYY	:	AM PM

DESCRIBE BELOW PERCEIVED INITIAL CAUSE OF EVENT AT TIME OF REPORTING	
Affected Structures - Indicate One	**Estimate Number of Fish Lost - Indicate One**
☐ SINGLE CAGE/NET ☐ MULTIPLE CAGE/NET	☐ ≥50 ☐ OTHER: _____

VERIFICATAION AND CONTACT INFORMATION

LICENCE HOLDER REPRESENTATIVE	**REPRESENTATIVE SIGNATURE**
CONTACT PHONE NUMBER	**CONTACT EMAIL ADDRESS**

A3. Escape Event Determination and Mitigation Form

Following the Notification of an Escape Event, the Licence Holder must report the following information within **48 HOURS OF DISCOVERY OF A SUSPECT OR KNOWN FISH LOSS, VIA EMAIL (CVO_CSV@gnb.ca) to the CHIEF VETERINARY OFFICER FOR THE NEW BRUNSWICK DEPARTMENT OF AGRICULTURE, AQUACULTURE AND FISHERIES.**

COMPANY INFO

LICENCE HOLDER	
AQUCULTULRE LEASE	MF -
BAY MANAGEMENT AREA	☐1 ☐2A ☐2B ☐3A ☐3B ☐3C ☐5 ☐6

ESCAPE EVENT INFORMATION

DATE NOTIFICATION EVENT WAS SUBMITTED TO CVO	**WAS LOSS INIITALLY REPORTED AS SUSPECT OR KNOWN**	**IF SUSPECT, HAS THE EVENT CLASSIFICATION CHANGED**
DD-MMM-YYYY	SUSPECT KNOWN	YES NO
DATE & TIME WHEN EVENT WAS DISCOVERED		
DD-MMM-YYYY	:	AM PM
DATE & TIME WHEN EVENT OCCURRED, ESTIMATE IF NOT KNOWN		
DD-MMM-YYYY	:	AM PM

PROVIDE FURTHER DETAILS BELOW ON CAUSE OF SUSPECTED/KNOWN LOSS

SPECIES OF FINFISH INVOVLED IN INCIDENT	**ESTIMATE NUMBER OF FISH LOST**	**AVERAGE WEIGHT (KG) OF FISH POPULATION**

INDICATE ID(S) OF NET(S) AND/OR CAGE(S) IMPACTED BY EVENT, INDICATE AS APPLICABLE	
☐ CAGE(S):	☐ NET(S):
DESCRIBE IMMEDIATE CORRECTIVE ACTIONS UNDERTAKEN	
REMEDIATION/RECAPTURE MEASURES PROPOSED	

AUTHORIZATION

I [**LICENCE HOLDER REPRESENTATIVE**] HEREBY AUTHORIZE THE CHIEF VETERINARY OFFICER FOR THE NEW BRUNSWICK DEPARTMENT OF AGRICULTURE, AQUACULTURE AND FISHERIES TO CONTACT THE RELEVANT REGULATORS AND STAKEHOLDERS REGARDING THE ABOVE ESCAPE EVENT.

INDICATE AGREEMENT WITH STATEMENT ABOVE: YES ☐ NO ☐

DATE	LICENCE HOLDER REPRESENTATIVE	REPRESENTATIVE SIGNATURE
DD-MMM-YYYY		

A4. Escape Event Final Report Form

Following submission of the Escape Event Determination and Mitigation, the Licence Holder must report the following information within **14 DAYS OF DISCOVERY OF A SUSPECT OR KNOWN FISH LOSS, VIA EMAIL (CVO_CSV@gnb.ca) to the CHIEF VETERINARY OFFICER FOR THE NEW BRUNSWICK DEPARTMENT OF AGRICULTURE, AQUACULTURE AND FISHERIES.**

COMPANY INFO

LICENCE HOLDER	
AQUCULTULRE LEASE	MF -
BAY MANAGEMENT AREA	☐1 ☐2A ☐2B ☐3A ☐3B ☐3C ☐5 ☐6

ESCAPE EVENT INFORMATION

DATE & TIME WHEN EVENT OCCURRED, ESTIMATE IF NOT KNOWN		
DD-MMM-YYYY	: AM PM	
SPECIES OF FINFISH INVOVLED IN INCIDENT	**ESTIMATE NUMBER OF FISH LOST**	**AVERAGE WEIGHT (KG) OF FISH POPULATION**
INDICATE ID(S) OF NET(S) AND/OR CAGE(S) IMPACTED BY EVENT, INDICATE AS APPLICABLE		
☐ CAGE(S):	☐ NET(S):	

IDENTIFICATION OF CAUSE OF EVENT

Select from the following all that apply regarding the cause of the fish escape event. If Other is selected, explain in the space provided. **Follow any additional instructions included and attach any additional documentation to this submission.**

☐ System Failure	Failure of containment structures or anchoring systems that result from a technological failure not related to nets, generally of a catastrophic nature. Can most often be attributed to extreme weather or ecological events (ex. floods). **Provide the dates of the most recent site inspection as per Section 5.5 of the *Code of Containment for Finfish Aquaculture in New Brunswick* as it relates to the event.**
☐ Boat Operations	Net or infrastructure damage resulting from propeller or whole boat collisions with the system structure (cage, nets, grid, moorings, etc.).
☐ Net Failure - P	Net damage resulting from **PREDATORS** such as marine mammal, fish, bird, etc. attacks.
☐ Net Failure - M	Net tears resulting from poor or inadequate **MAINTENANCE** such as chafing of nets due to contact with abrasive equipment, failure to repair small holes, deterioration of nets with age, failure to remove dead fish or debris, etc. **Provide the dates of the most recent site inspection as per Section 5.5 of the *Code of Containment for Finfish Aquaculture in New Brunswick* as it relates to the event.**

☐ Net Failure - V	Fish loss resulting from a suspected or known **VANDALISM** incident.
☐ Handling	Fish loss that results during fish handling events such as fish transfer, net changes, towing, sorting, sea lice treatments, grading, harvesting, etc. and is not related to failure of the integrity of a net-pen or containment structure. This type of escape can generally be directly attributed to human error.
☐ Other	

CORRECTIVE ACTIONS, RESPONSE AND PREVENTATION

DESCRIBE THE MITIGATION MEASURES THAT WERE (OR WILL BE) PUT IN PLACE TO ADDRESS THE CAUSE OF THE BREACH OF CONTAINMENT		
DESCRIBE IMMEDIATE CORRECTIVE ACTIONS UNDERTAKEN INCLUDING PREVENTATIVE, IF APPLICABLE		
DESCRIBE DETAILS OF REMEDIATION/RECAPTURE MEASURES UNDERTAKEN		
WERE RECAPTURE EFFORTS UNDERTAKEN?	YES NO	**IF YES, PERMIT #:**
IF FISH WERE RECAPTURED, INDICATE LOCATION(S) OF RECAPTURE		

NUMBER OF FISH RECAPTURED	**% OF RECAPTURE [(# RECAPTURED ÷ # ESCAPED) X 100)]**	**FINAL ESTIMATED TOTAL FISH ESCAPED/LOST**

VERIFICATAION AND CONTACT INFORMATION

LICENCE HOLDER REPRESENTATIVE	**REPRESENTATIVE SIGNATURE**
CONTACT PHONE NUMBER	**CONTACT EMAIL ADDRESS**