

Annual Compliance Report - 2013
on the
Code of Containment
for the Culture of Salmonids in
Newfoundland and Labrador



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EXECUTIVE SUMMARY

The Newfoundland and Labrador salmonid aquaculture industry continues to experience growth. Production has risen in 2013 to 22,196 MT. The Department of Fisheries and Aquaculture manages the growth of the industry through policies and management plans designed to ensure the sustainability of the industry and environment. The Code of Containment is an integral part of the approach to successfully manage the growth of the industry.

Compliance with the Code continues to be high. However, in an effort to continually seek improvements and efficiencies, the Code underwent major revisions in late 2012. The revisions were endorsed through the Aquaculture Liaison committee, a committee of industry, government and public stakeholder. These new changes were implemented in the 2013 inspection year.

The Code of Containment inspection/reporting program was conducted by the Department of Fisheries and Aquaculture (DFA) throughout 2013. Inspections occurred on the 41 active aquaculture sites between May and January. Reporting and inspection results are summarized below:

Nets and Net Testing: 680 nets were recorded in grower's net inventories in 2013. DFA staff recorded 199 nets on sites in the spring and 248 nets on sites in the fall. There was full compliance with net inventories and audits.

Cage Types: No new cage types were deployed this year.

Mesh Sizes: Appropriate mesh sizes were in use as per industry standard practice and in accordance with mesh size reports commissioned in 2000/01.

Moorings: A "Mooring Maintenance/Replacement Plan" is required to address moorings under the Code. These are to be resubmitted annually. All growers are in compliance.

Inventory Monitoring and Reconciliation: Industry was fully compliant with this section of the Code. Industry wide, the inventory reconciliation covered a starting number of 15,175,249 salmonids and ended with 10,348,282 salmonids.

Ice Protection: There were no new overwintering sites utilized in 2013.

System Inspections: DFA performed 17 site inspections in spring and 23 in the fall. 6 issues were recorded. Only one issue was deemed critical and was re-inspected.

Predator Control Plans: Predator control has been addressed on a site by site basis through the cage culture application. The application requires applicants to describe what predators they expect to deal with and how they will deal with them.

Handling Practices: There have been no issues with handling practices under the Code.

Measures for The Recapture of Escaped Fish: DFO is responsible for this section of the Code. No new industry-led recapture measures were implemented under the Code in 2013. There was one industry authorized recapture fishery for Atlantic salmon employing nets in the Bay d'Espoir area in 2013. Two limited experimental angling fisheries were authorized to evaluate the use of angling as a tool to remove escaped farmed Atlantic salmon from estuaries outside of the normal angling season and from rivers in 2013. There were three confirmed escape events reported this year from the Bay d'Espoir and Fortune Bay areas. Biological characteristics of fish from these incidents were collected in 2013. Analyses will be discussed at the next meeting of the liaison committee and may lead to review and updating of approaches to recapture.

1.0 INTRODUCTION

The Code of Containment for the Culture of Salmonids in Newfoundland and Labrador has been in effect for fourteen years. This Annual Compliance Report outlines compliance and inspection efforts as specified by the Code for the calendar year of 2013. This report will outline the effectiveness of the Code by indicating the compliance of the industry to the requirements, the inspection efforts of the Department of Fisheries and Aquaculture, the number of escapes (if any) and effectiveness of recapture efforts.

One of the objectives of the Code is to be forward-looking and seek continual improvement. This report will also indicate where improvements or revisions to the Code have been made. It should be noted that any and all revisions are undertaken with the full consultation of industry and both levels of government. The Aquaculture Liaison Committee meeting is the venue where such revisions are discussed. In January of 2013, a meeting was held to discuss the 2012 Annual Compliance Report. Subsequently, the Code of Containment was revised and updated. These revisions were in effect during the 2013 inspection season.

The Code of Containment has also been recognized internationally for its adequacy in addressing the issue of escaped fish. The Code of Containment for the Culture of Salmonids in Newfoundland and Labrador is recognized as an effective and leading document that addresses containment and escapes in Canada.

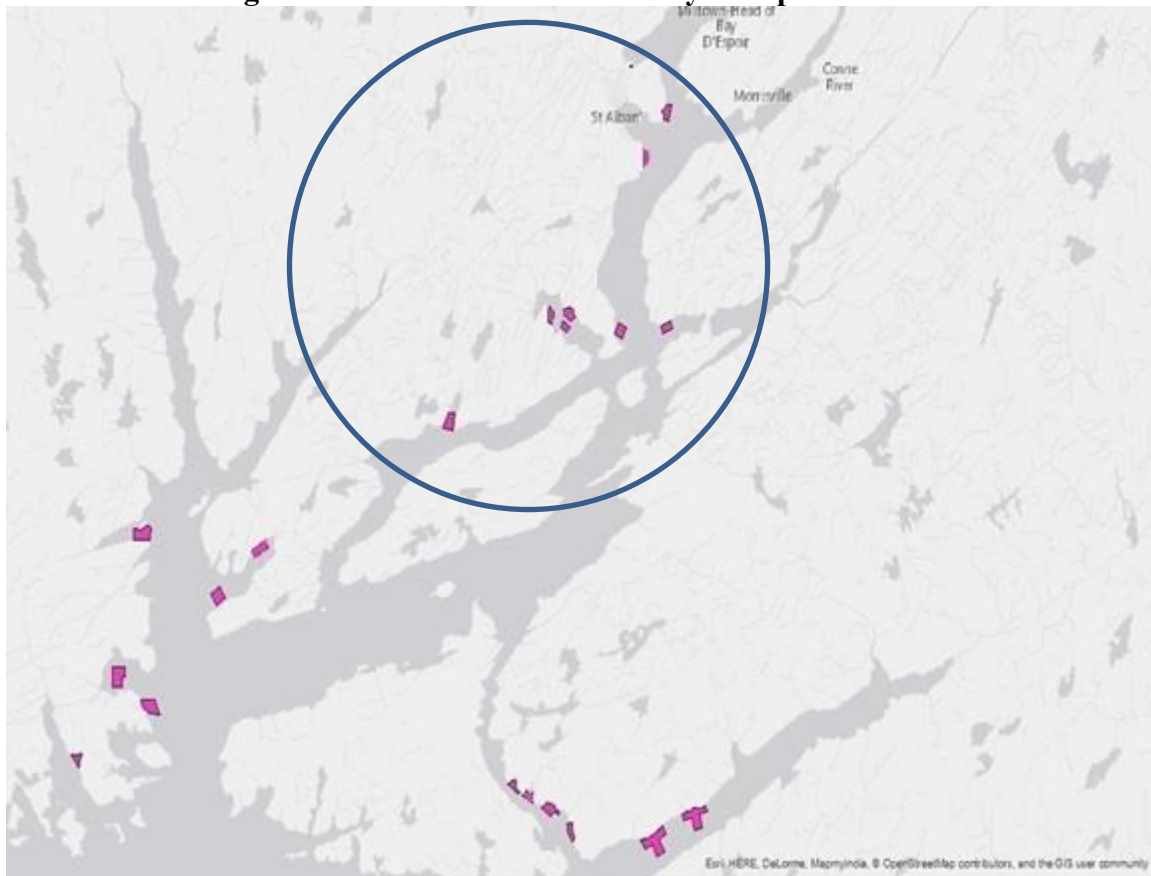
2.0 INDUSTRY OVERVIEW

The salmonid aquaculture industry in Newfoundland and Labrador in 2013 consisted of 5 companies growing Atlantic salmon, Steelhead trout and Arctic Charr with farming operations in both Bay D'Espoir and Fortune Bay. There were 87 sites licensed for Atlantic Salmon and Steelhead production in 2013. There were also 1 char site in use in 2013. 41 sites were in active production. Production for 2013 salmonids was 22,196 MT.

2.1 Number of Active Sites In Bay D’Espoir in 2013

Both salmon and steelhead are grown in Bay d’Espoir and in 2013, there were 20 active sites (currently farming fish). The following figure indicates the 20 sites. Circled sites are trout sites; sites not circled are salmon sites.

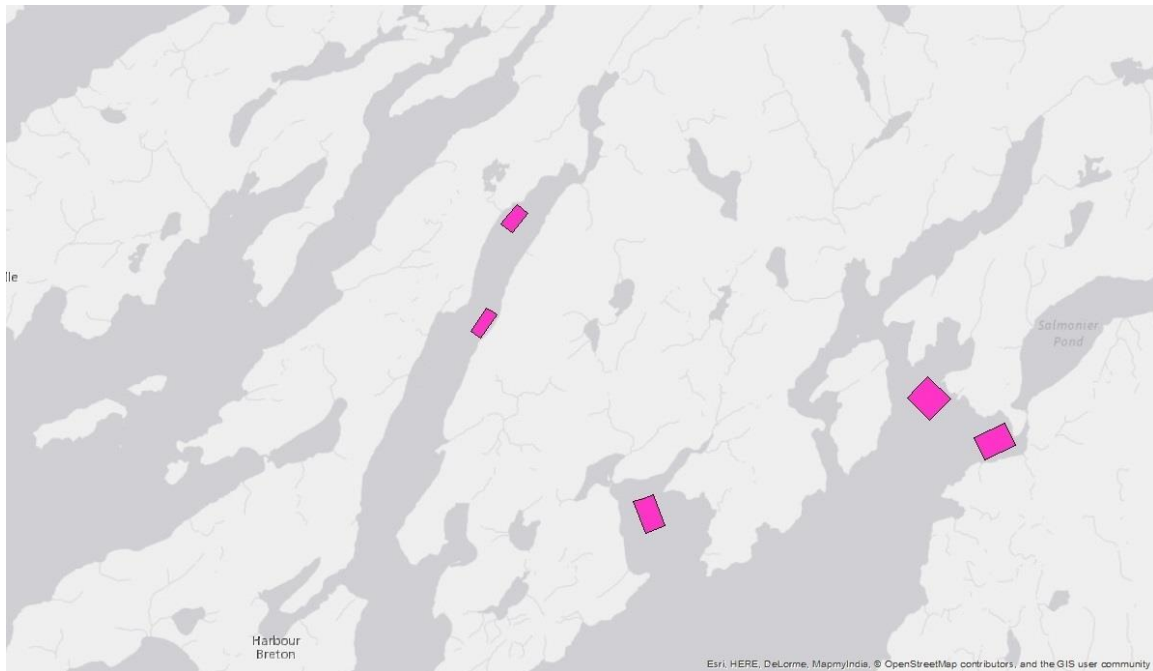
Figure 1: Active finfish sites in Bay D’Espoir in 2013.



2.2 Number of Active Sites in from Harbour Breton Bay and Great Bay De l'Eau

There were 5 active sites from Harbour Breton Bay and Great Bay De l'Eau in 2013 growing Atlantic salmon.

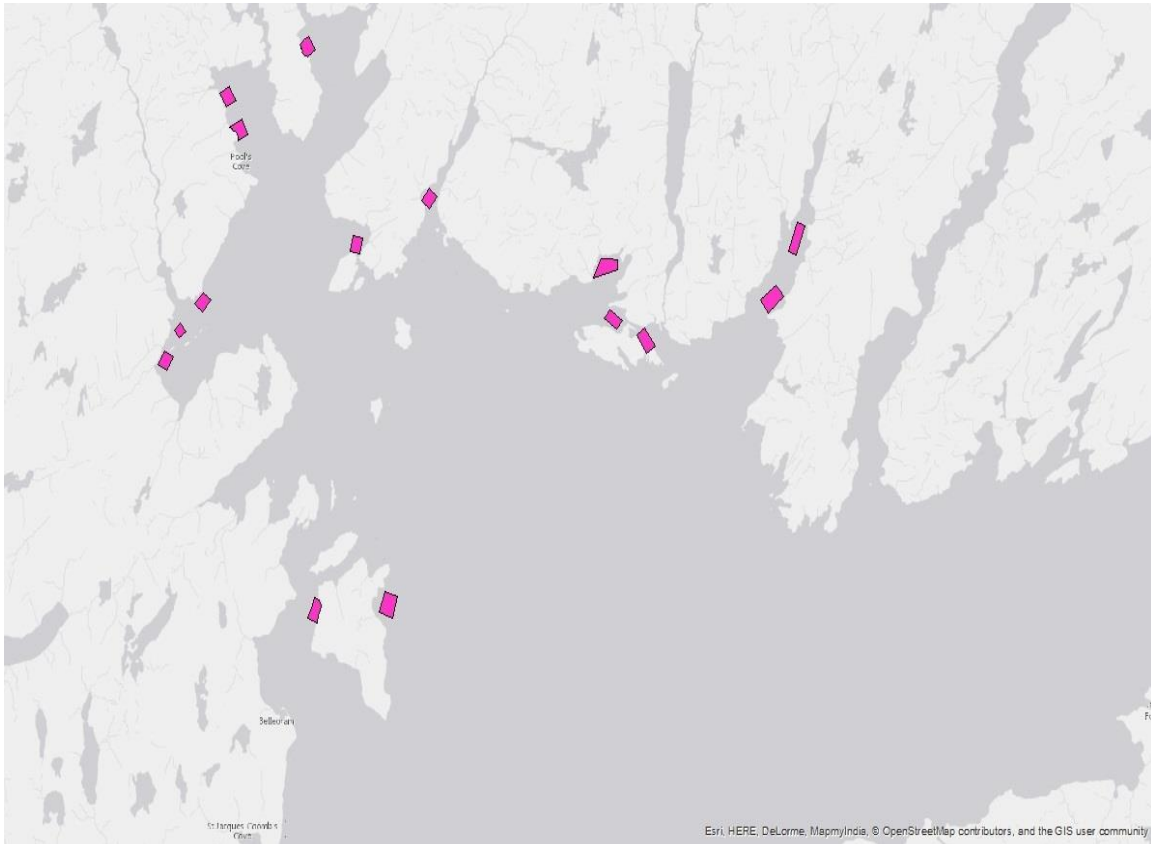
Figure 2: Active finfish sites from Harbour Breton Bay and Great Bay De l'Eau in 2013.



2.3 Number of Active Sites in from Fortune Bay

There were 15 active sites from Fortune Bay in 2013 growing Atlantic salmon.

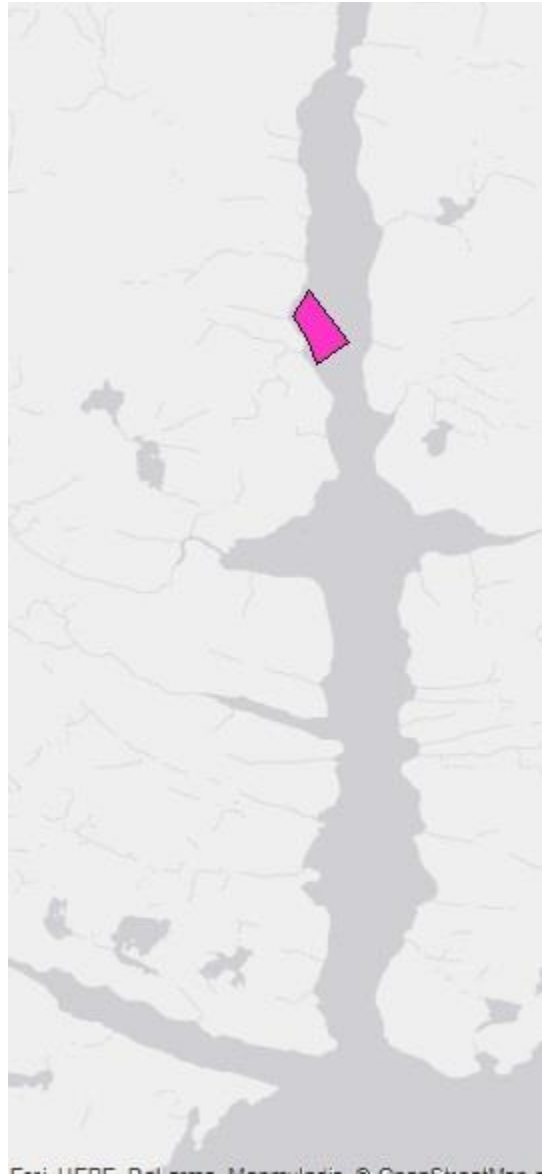
Figure 3: Active finfish sites from Fortune Bay in 2013.



2.4 Number of Active Sites in from Facheaux Bay

There was 1 active site in Facheaux Bay in 2013 growing Atlantic salmon.

Figure 4: Active finfish sites from Facheaux Bay in 2013.



3.0 APPENDIX 1 - EQUIPMENT STANDARDS

A1.1 Nets and Net Testing

This section of the Code of Containment addresses net strength and integrity. Equipment failure and in particular, net failure, has been recognized as a leading cause of escape incidents internationally. The Newfoundland Code of Containment focuses heavily on nets in both this section and in appendix 4 - System Inspections. Specific requirements for nets and net testing can be found in Appendix A1.1, page 11 of the Code of Containment.

Compliance:

The nets used for finfish aquaculture along the south coast are made both locally and in New Brunswick of either dyneema or a nylon, knotless material and are treated with antifoulant. Mesh sizes vary depending on the size of fish going into the cage. Nets over three years of age must be tested every 18 months. The following table provides a consolidated summary of the net inventories submitted by growers for 2013. See Appendix C for 4 Point Stress Test Inspection form used for net testing. Please refer to Appendix A1.1, page 14 for net strength standards.

Net Inventories	Number of nets
Total number of nets in inventories	680
Number of nets over 3 years of age	208
Number of nets under 3 years of age	306
Number of nets of unknown age*	166
Number of nets audited	285
Nets in use during spring inspection**	199
Nets in use during fall inspection**	248

* Nets of unknown age are treated as if they are over three years of age.

** Refers to site System Inspections, see appendix 4 of the Code of Containment and page 16 of this report.

Not all nets in inventories are in active use at the same time. DFA has verified that nets in inventories in 2013 were tested by a net testing agent *or* were under three years of age. Each company's net inventory is audited to ensure nets are tested and to verify net age. Net tag numbers are recorded during system inspections and cross referenced with the net inventories each farm submits.

A1.2 Cage Types

Two types of cage designs were in use in 2013. The first and most common is the circular High Density Polyethylene (HDPE) plastic cages. These are manufactured locally to national and international industry standards and have proved to be very reliable in Newfoundland's environment. They are manufactured in several sizes but are found most commonly in 70m, 90m and 100m circumference sizes as well as 150m. The second type in use is square systems, made of both steel and HDPE. However; these are slowly being phased out of use in favor of the HDPE circular cages.

Compliance:

No new types of cage systems were deployed during 2013.

A1.3 Mesh Sizes

Industry continues to use mesh sizes that meet or exceed the minimum size retained per mesh size as determined in "Determination of the Appropriate Cage Mesh Size for Retention of Salmonid Juveniles" by the Memorial University of Newfoundland's Marine Institute.

Compliance:

The industry was using appropriate mesh size prior to the study being completed. The study, completed in 2000, verified industry practice. Mesh sizes of nets to be used during production are listed in the cage culture application form for all licensed sites.

A1.4 Moorings

This section of the Code addresses mooring components. Mooring failure has not been identified as a cause of escapement in the Newfoundland industry. Mooring inspections are not currently covered under this Code. Attempts at mooring inspections were made in the past (via ROV) but they were impractical and did not yield reliable results. Mooring systems have changed substantially in the last two years, with growers utilizing larger systems with more anchorage. Site holders monitor their own systems and regulatory perform maintenance and replacement of the systems. The current Code requires that the grower submit a Mooring Maintenance and Replacement Plan annually for each site in production or newly installed mooring system. Additionally updated plans will be required upon replacement of a site system. See Form A.6 within Code.

Compliance:

All Mooring Maintenance and Replacement Plans were submitted for sites in production in 2013.

4.0 APPENDIX 2 - INVENTORY MONITORING AND RECONCILIATION

Industry members are required to submit an annual inventory review to DFA for the calendar year. They are to be submitted at the beginning of the next calendar year (i.e. Inventory reconciliations for 2013 will be submitted in January/February 2014).

Compliance:

There was full compliance for the year 2013. Industry wide, the 2013 Inventory Reconciliations tracked three year classes of fish, starting with an inventory total of 15,175,249 salmonids and ended with 10,348,282 salmonids. Data from growers indicated that there were both inventory shrinkages and inventory surpluses. Evidence of shrinkage or surplus is only experienced after a cage has been completely emptied by either harvesting or grading out (transfers). A DFA review of shrinkage and surpluses has shown that shrinkage and surpluses vary by species and year class of fish.

Table 2 is an example of a particular cage grouping which shows a sample of the inventory reconciliation exhibiting both shrinkages and surplus (positive or negative deviations). The example illustrates the inherent errors involved in fish numbers. Errors are a result of counting errors when stocking, grading or during mort removal.

Table 2

Cage Number	Starting Number of fish	Year Class	Number of	Number of	Number of	Number of	Counting Deviation	Number of	Fish Remaining
			Fish Introduced	Fish Mortalities	Fish Removed/Harvest	Fish Removed/Transfer		Fish Escaped	
1	18829	2011		1281	16864		-684		0
2	30536	2011		1006	27357		-2173		0
3	15328	2011		2100	13519		291		0
4	30224	2011		1863	29331		970		0
5	31385	2011		1030	28286		-2069		0
6	21802	2011		619	19991		-1192		0
7	20587	2011		809	15517		-4261		0
8	33850	2011		864	32931		-55		0
9	32128	2011		2647	30817		1336		0
10	37161	2011		1502	36962		1303		0
11	31993	2011		1247	27400		-3346		0
12	36177	2011		1453	31163		-3561		0
TOTAL	340000		0	16421	310138	0	-13441	0	0

Code of Containment - Inventory Reconciliation -SPECIES – 20XX

Company Name: _____

Aquaculture Site Licence #'s: _____

Contact Name: _____

Site Locations: _____

Company Address: _____

Number of Active Cages: _____

Company Telephone: (709) _____

START DATE: January 1, 20XX

Company Fax: (709) _____

END DATE: December 31, 20XX

Signature: _____

Cage Number	Starting Number of fish	Year Class	Number of Fish Introduced	Number of Fish Mortalities	Number of Fish Removed/Harvest	Number of Fish Removed/Transfer	Counting Deviation	Number of Fish Escaped	Fish Remaining
1									0
3									0
4									0
5									0
6									0
7									0
8									0
TOTAL									

Note: Sites used during this year included

Note: 1. Use additional pages as required.

5.0 APPENDIX 3 - ICE PROTECTION

The industry continues to use proven overwintering sites protected from moving ice.

Compliance:

The industry has not applied for any new overwintering sites where moving ice may be an issue. The Code requires that new seasonal sites be reviewed by DFA for the potential of damage from moving ice. Any new seasonal sites may require ice booms. Existing overwintering sites at Roti Bay are proven sites protected from moving ice.

6.0 APPENDIX 4 - SYSTEM INSPECTIONS

The Code of Containment requires that the industry maintain ongoing inspections of their cage and mooring system structures. DFA is required to complete seasonal inspections on each site in operation usually in late spring and late fall after cages are secured on site for that growing period.

Season	Number of sites inspected	Number of cages/nets on site	Number of issues recorded
Spring	17	199	1
Fall	23	248	5

*Inspections suspended, see below for explanation.

*DFA performed 40 cage system inspections in 2013. Some fall inspections were suspended in the Bay d'Espoir region due to biosecurity issues at sites affected with ISA_v.

Only sites that are engaged actively in culturing fish are inspected. System inspections include visually checking all nets near the surface for any holes and tears. The tag number of each net is recorded. Nets are also checked to verify if they were tied into the cage collar. Each cage on site is physically checked by completely walking around it and checking its condition. This includes checking the rails, stanchions and the cage collar for structural integrity, excessive wear and major cracks. Surface moorings are also visually checked for excessive wear and overall condition. This includes checking all visible lines, thimbles, shackles, chains and compensator buoys.

In addition to a visual inspection there is a record check where the inspector will ensure all the sites paperwork (Weekly Site Surface Inspection, Dive Net Checks, etc.) are complete and in compliance with timelines set out in the code.

Compliance:

There was only one major compliance issues that required a follow up inspection. A cage was damaged and repaired which was confirmed during the follow up re-inspection. Five nets were discovered to be past the testing date. These nets were either close to being harvested out or were being harvested out. In all instances DFA recommend harvesting

to quickly clean the fish out of the affected cages in the instances of the nets being past the testing date. DFA monitored the harvest to ensure they were completed in a timely manner. The industry fully cooperated with DFA during each site inspection.

7.0 APPENDIX 5 - PREDATOR CONTROL PLANS

Each aquaculture site requires a plan to deal effectively with predators because they can be responsible for creating holes in nets which may contribute to escapement. Effective in the fall of 2002, Predator Control Plans were incorporated into all Aquaculture license applications.

Compliance:

Industry is fully compliant with this section of the Code. DFA has on record predator control plans for each site.

8.0 APPENDIX 6 - HANDLING PRACTICES

The salmonid industry handles fish in accordance with practices outlined in the Code are humane and guard against escape of fish

Compliance:

No issues of compliance were noted.

9.0 APPENDIX 7- MEASURES FOR THE RECAPTURE OF ESCAPED FISH

DFO is responsible for the monitoring and implementation of this section of the Code. A Rapid Response Licensing Policy for the recapture of escaped fish was put in place in the fall of 2002, replacing the former recapture plan of 1999 (please see current copy of the code).

Since the Code of Containment has been in effect, escapes have decreased overall (see Table 3). This is despite the fact that production of salmonids in Bay D'Espoir and Fortune Bay has increased from 572 metric tonnes in 1995 to 22,196 metric tonnes in 2013.

**Table 3
REPORTED ESCAPES SINCE 1995**

Year	Salmon	Steelhead	Charr
1990		6600	
1991		1700	
1992			
1993			
1994			
1995		31000	
1996	140000	4000	
1997			
1998	63334	103500	
1999	6500	8000	
2000	0	46251	
2001	0	0	
2002	0	0	
2003	6500		
2004	0	0	
2005	0	0	
2006	0	0	
2007	500	4400	
2008		39653	
2009	300		
2010		32,443	69,827
2011		12,382	
2012	0	0	0
2013	20,800		5693

The current approach to recapture as specified in the Rapid Response Licensing Policy has not been proven to be effective in recovering significant proportions of estimated escaped fish following escape events. Delays between detection of losses and deployment of fishing gear, seasonal weather conditions that delay mobilization, subordination of recapture responsibilities to other on farm priorities following escapement incidents, tendency of escaped fish to disperse quickly from the location of release, and policy limitations that have restricted fishing effort to within the boundaries of the cage site only have all been factors contributing to recapture fisheries.

During 2013, efforts were to update this section of the code. A section on Post Escape Reporting which includes provisions for reviewing the incident and its cause, whether the recapture efforts were successful and how/if the incident could have been prevented. This will come into effect for the 2014 season.

Compliance:

There were three instances of escapes in 2013:

- 1) 20,500 – An uncommonly high tide combined with a storm even caused a cage to submerge allowing for the escape of fish through the bird net.
- 2) 300 – A harvesting misstep where a brail net let go causing a spill.
- 3) 5693 – A hole was tore in a net while moving it to a wharf for harvest.

10.0 APPENDIX 8- SUMMARY OF MAJOR CHANGES TO THE CODE OF CONTAINMENT (Proposed for 2014)

1) Appendix 4 – System Inspections (pg. 24)

Bullet 2 - industry members agree to comply with inspections of cages systems and mooring systems at the discretion of DFA or DFO. Audits will be conducted by DFA at a minimum of twice yearly (one audit in the spring, after fish entries; one audit in the fall/early winter) with at least 24 hours advance notice to the operator.

Suggested change - industry members agree to comply with inspections of cages systems and mooring systems at the discretion of DFA or DFO. Audits will be conducted by DFA at a minimum of twice yearly (one audit in the spring, after fish entries; one audit in the fall/early winter) with at least 1 week advanced notice to the operator to allowing for ample time to provide the required documentation as required during the Code inspection to be forwarded to the inspector or to the side scheduled for inspection.

2) Form A.5. – Code of Containment Site Audit form.

Add 'n/a' checkboxes to Surface Mooring section

3) Standardize format for net inventory reporting – a MS Excel spreadsheet (similar to the Inventory Reconciliation) to be forwarded to growers at the beginning of each calendar year.

4) Section A.1.2 – Cages – Bullet 4 – Remove the sentence “All nets are UV and antifoulant treated unless specified by DFA and/or DFO”

5) Add Section to Code on Post Escape review.