Annual Compliance Report - 2012

on the

Code of Containment

for the Culture of Salmonids in
Newfoundland and Labrador

Newfoundland
Labrador

Department of Fisheries and Aquaculture
Aquaculture Branch
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EXECUTIVE SUMMARY:

The Newfoundland and Labrador salmonid aquaculture industry continues to experience growth. Production has risen in 2012 to 16,831 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 in 2011. The revisions were endorsed through the Aquaculture Liaison committee, a committee of industry, government and public stakeholders. These new changes were implemented in the 2012 inspection year.

The Code of Containment inspection/reporting program was conducted by the Department of Fisheries and Aquaculture (DFA) throughout 2012. Inspections occurred on the 45 active aquaculture sites between May and January. Reporting and inspection results are summarized below:

Nets and Net Testing:
579 nets were recorded in grower's net inventories in 2012. DFA staff recorded 245 nets on sites in the spring and 411 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" was recommended to address moorings under the Code and was approved by the liaison committee for inclusion into the latest revision of the Code. Growers are developing mooring replacements plans.

Inventory Monitoring and Reconciliation: Industry was fully compliant with this section of the Code. Industry wide, the inventory reconciliation covered a starting number of 14,316,062 salmonids and ended with 15,012,228 salmonids.

Ice Protection: There were no new overwintering sites utilized in 2012.

System Inspections: DFA performed 26 site inspections in spring and 34 in the fall. 17 issues were recorded. Only one issue was deemed critical and was re-inspected. All other items were focused on during next round of inspection during 2012.

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. Recapture efforts and technology require review and updating and will be discussed at the next meeting of the liaison committee. There were no confirmed escape events reported this year.

1.0 INTRODUCTION:

The Code of Containment for the Culture of Salmonids in Newfoundland and Labrador has been in effect for eleven years. This Annual Compliance Report outlines compliance and inspection efforts as specified by the Code for the calendar year of 2012. 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 and the 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. It meets on an as-needed basis and last met in December of 2011 where updates to the Code were discussed and approved. Subsequently a revised Code was introduced in 2012 titled "Code of Containment 2012". These revisions were in effect during the 2012 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:

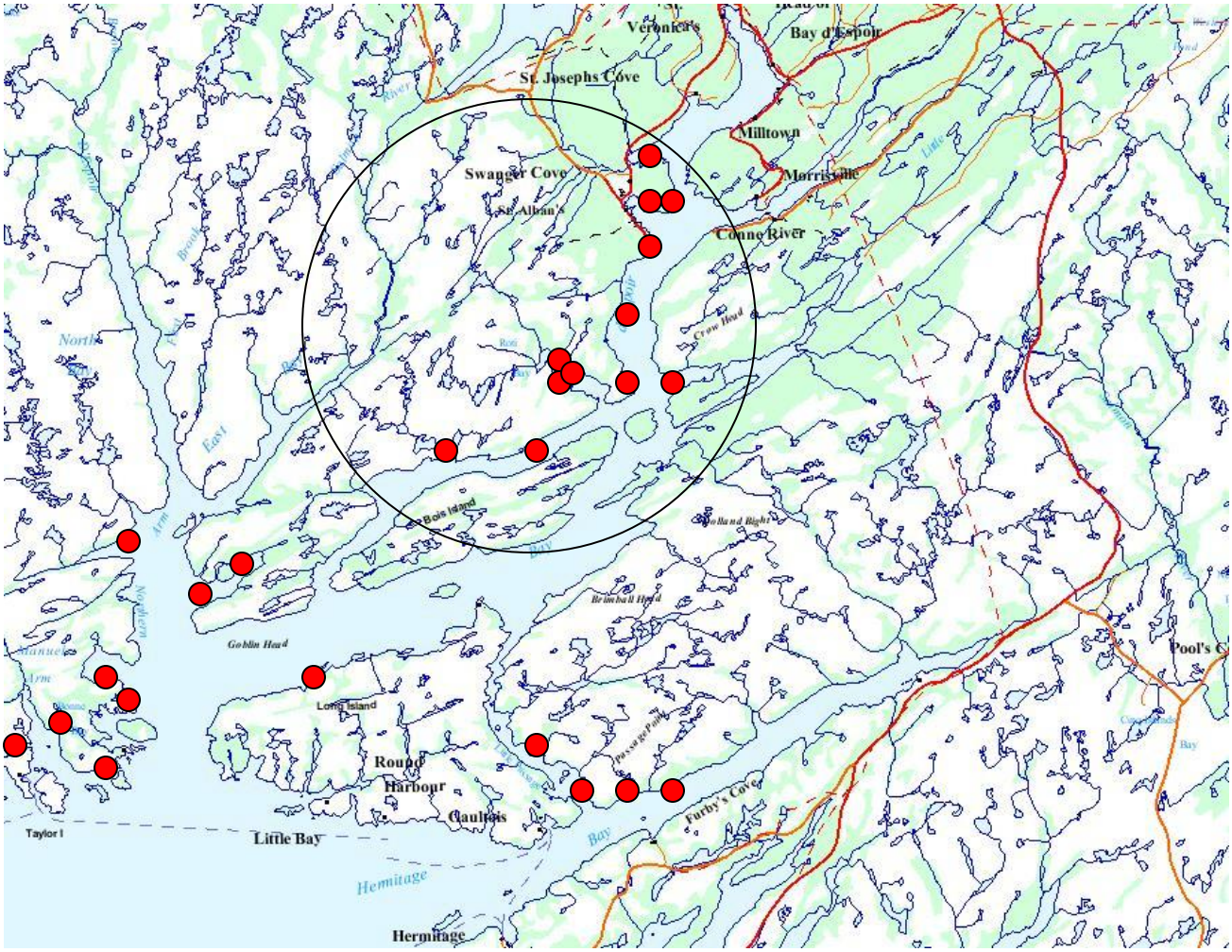
The salmonid aquaculture industry in Newfoundland and Labrador in 2012 consisted of 5 companies growing Atlantic salmon and Steelhead trout with farming operations in both Bay D'Espoir and Fortune Bay. There were 86 sites licensed for Atlantic Salmon and Steelhead production in 2012. There were also 2 char sites in use in 2012. 45 sites were in active production.

The production level of the industry is expected to increase over the next few years as sites that are licensed but have not been in production are developed. Major expansion is expected in Atlantic Salmon production. Steelhead production will be higher; however, it will be at lower levels than the salmon production. Production for 2012 salmonids was 16,831 MT.

2.1 Number of Active Sites In Bay D'Espoir in 2012

Both salmon and steelhead are grown in Bay d'Espoir and in 2012, there were 25 active sites (currently farming fish). The following figure indicates the 25 sites. Sites not circled are salmon sites.

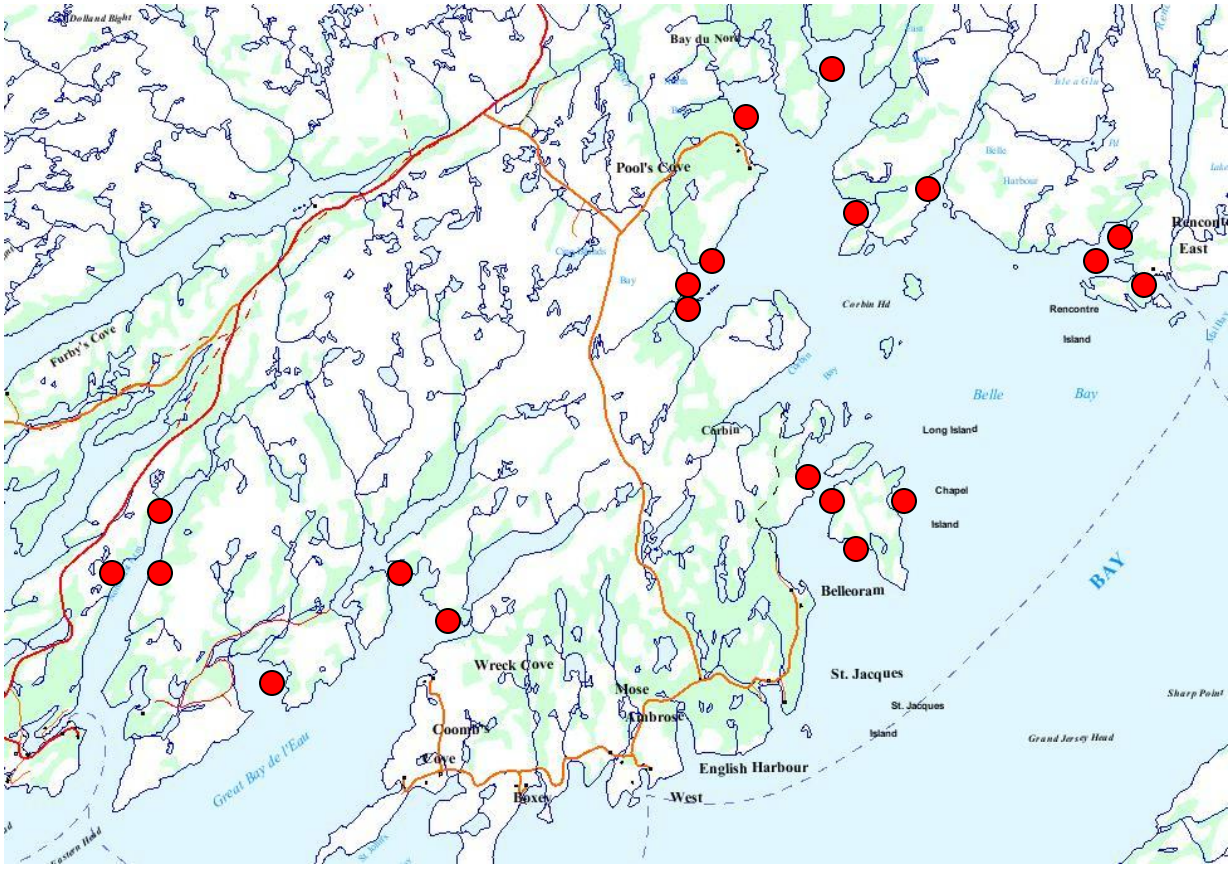
Figure 1: Active finfish sites in Bay D'Espoir in 2012.



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

There were 20 active sites from Harbour Breton Bay to Fortune Bay in 2012 growing Atlantic salmon.

Figure 2: Active finfish sites from Harbour Breton Bay to Fortune Bay in 2012.



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, made both locally and in New Brunswick, are 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 2012. See Appendix C for the Four 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	579
Number of nets over 3 years of age	169
Number of nets under 3 years of age	287
Number of nets of unknown age*	123
Number of nets audited	99
Number of net retired	66
Nets in use during spring inspection**	245
Nets in use during fall inspection**	411

* 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 2012 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 2012. 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 a square system made of both steel and HDPE. These, however, are slowly being phased out of use in favour of the HDPE circular cages.

Compliance:

No new types of cage systems were deployed during 2012.

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 Institutein 2000.

Compliance:

The study verified that the industry is using the appropriate mesh sizes. Mesh sizes of nets to be used during production are listed in the cage culture application form for all licensed sites. DFA does not perform audits or inspections on this aspect of the Code.

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 for each new site or newly installed mooring system. Since the implementation of the new revisions of the code no Mooring Plans have been submitted. Additionally updated plans will be required upon replacement of a site system. See Form A.6 within Code.

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 2012 will be submitted in January/February 2013).

Compliance:

There was full compliance for the year 2012. Industry wide, the 2012 Inventory Reconciliations tracked three year classes of fish, starting with an inventory total of 14,316,062 salmonids and ending with 15,012,228 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 mortality removal.

Table 2

Cage Number	Starting Number of fish	Year Class	Number of Fish Introduced	Number of Fish Mortalities	Number of Fish Removed/Harvested	Number of Fish Removed/Transferred	Counting Deviation	Number of Fish Escaped	Fish Remaining
1	20670	2010	0	27	21168	0	525	0	0
2	32654	2010	0	56	32556	0	-42	0	0
3	32809	2010	0	297	34067	0	1555	0	0
4	32101	2010	0	229	32167	0	295	0	0
5	32907	2010	0	301	33728	0	1122	0	0
6	22685	2010	0	240	23052	0	607	0	0
7	33668	2010	0	127	33321	0	-220	0	0
8	31115	2010	0	65	32061	0	1011	0	0
9	16774	2010	0	26	17094	0	346	0	0
10	18442	2010	0	79	20080	0	1717	0	0
11	23450	2010	0	129	27603	0	4282	0	0
12	23679	2010	0	205	26233	0	2759	0	0
13	26633	2010	0	291	27068	0	726	0	0
14	32327	2010	0	307	31026	0	-994	0	0
15	31057	2010	0	447	32028	0	1418	0	0
16	30659	2010	0	257	32101	0	1699	0	0
TOTAL	**441630**	**2010**	**0**	**3083**	**455353**	**0**	**16806**	**0**	**0**

Code of Containment - Inventory Reconciliation -SPECIES – 20XX

Company Name:_____

Contact Name:_____

Company Address:_____

Company Telephone: (709)_____

Company Fax: (709)_____

Aquaculture Site Licence #'s:_____

Site Locations:_____

Number of Active Cages:_____

START DATE: January 1, 20XX

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: 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	25*	245*	8
Fall	34	411	9

*Inspections suspended, see below for explanation.

*DFA performed 59 cage system inspections in 2012. Spring inspections were suspended in the Bay d'Espoir region due to the detection of ISAv on a marine cage site. Due to biosecurity issues, the inspections were suspended.

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.

Compliance:

Only minor deficiencies were seen on sites. These included moved cage posts and nets in the water past the required testing period. In all cases, DFA advised the company to initiate repairs. Later inspections confirmed that the necessary repairs had been made. 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 fish escapes. 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 accepted industry wide that 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 (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 16,831 metric tonnes in 2012.

Table 3
REPORTED ESCAPES SINCE 1995

Year	Salmon	Steelhead	Charr
1990	0	6,600	0
1991	0	1,700	0
1992	0	0	0
1993	0	0	0
1994	0	0	0
1995	0	31,000	0
1996	140,000	4,000	0
1997	0	0	0
1998	69,500	93,000	0
1999	6,300	8,000	0
2000	0	45,000	0
2001	0	0	0
2002	0	0	0
2003	6,500	0	0
2004	0	0	0
2005	0	0	0
2006	0	0	0
2007	500	4,400	0
2008	0	39,653	0
2009	300	0	0
2010	0	32,443	69,827
2011	0	12,382	0
2012	0	0	0

The current approach to recapture as specified in the Rapid Response Licensing Policy has never been proven to be very effective in actual escape events. There have been problems with fishing gear; delays between detection of losses; deployment delays of fishing gear; problems with subordination of recapture responsibilities to other on farm priorities following escapement incidents; and policy limits that restrict fishing effort to the cage site only.

There has been little work done since 2000/01 towards improving recapture methods and technology. While there have been few escapes in recent years, discussions on the future directions for recapture is warranted.

Compliance

No instance of escaped reported in 2012.

10.0 APPENDIX 8- SUMMARY OF MAJOR CHANGES TO THE CODE OF CONTAINMENT:

Code of Containment, Appendix 1, A1.1,

Net testing:
Net testing is changed to once every 18 months.

Diver net Inspections:
Diver net inspections are to be performed every 90 days. Diver reports noting net inspections will be acceptable evidence of net inspections or a dedicated form can be developed.

Age of net audits and net testing Audit:
Aquaculture Development has engaged the AAHD to determine a statistically valid sample size for audits. Sample size recommendations are being developed.

Retired nets:
A list of all nets retired from the previous year must be listed with all net inventories.

Code of Containment, Appendix 1, A1.2
Cages

Net attachment:
All net attachment points securely tied to the cage with ½' rope polypropylene rope or rope of equivalent breaking strength (see table within Code).

Code of Containment, Appendix 1, A1.4

Moorings:
Growers will be required to submit a Mooring Maintenance and Replacement Plan. Updated plans will be required upon replacement of a site system. See form A.6 in revised Code.

In Code of Containment, Appendix 2

Inventory Reconciliation:
IR's will remain cage based for salmon and trout, however, trout will be based on year class instead of site with the sites used that calendar year listed and current location of cages listed.

Code of Containment, Appendix 4, System Inspections

DFA's audit/inspection procedures for diver and surface inspections.
DFA will audit and inspected diver net inspection forms and surface component inspections forms twice annually in conjunction with the twice annual site surface inspections that DFA conducts. During these inspections, DFA will perform the regular inspection of site surface components, recording of net tags and site diagrams but will also request site inspection and diver inspection reports.

Records will be assed to ensure they are in compliance with the Code requirements. DFA inspectors will use form A.5 for these audits and inspections (see revised Code).

Formal cage system surface inspections:
Formal cage system surface component inspections will be preformed one per week and recorded on form A.4 in revised Code.

Code of Containment, Appendix 6, Handling Practices

Handling and Towing Practices:
Instead of referencing the Code of Practice, the procedures will be written directly into the Code. See Attached Appendices 6.1 and 6.2.

Code of Containment, Appendix 7, Recapture:

Recapture
The requirement to notify DFA as well as DFO in the event of an escape or suspected escape has been added to the Code. The wording in the recapture section of the Code has been changed to specify that whether or not to recapture will be at the direction and discretion of DFO.