MSC Pre-assessment Report

For The

Canadian Cod Stewardship Fishery in NAFO Divisions 2J3KL

Facilitated By the

World Wildlife Fund
Fish Food and Allied Workers

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Contents

Glossary

Term	Definition
Blim	Limit Reference Point for Biomass
CAFSAC	Canadian Atlantic Fisheries Scientific Advisory Committee
CCAO	Catch Certification Audit Office
CCP	Catch Certification Program
CHP	Conservation Harvesting Plan
CIL	Cold Intermediate Layer
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSAS	Canadian Science Advisory Secretariat
CSTN	Canadian Sea Turtle Network
DFO	Fisheries and Oceans Canada
EAM	Ecosystem Approach to Management
EBSA	Ecological and Biological Sensitive Areas
EEZ	Exclusive Economic Zone
EPLPC	Eastport Peninsula Lobster Protection Committee
ETP	Endangered, Threatened or Protected
FFAW	Fish, Food and Allied Workers
FPP	Fisheries Protection Program
FPPS	Fisheries Protection Policy Statement
FRCC	Fisheries Resource Conservation Council
GN	Gillnet
HL	Hand line
ICNAF	International Commission for Northwest Atlantic Fisheries
IFMP	Integrated Fisheries Management Plan
IQ	Individual Quota
LOMA	Large Ocean Management Area
LL	Longline
LOA	Length Overall
LRP	Limit Reference Point
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organization
NCEM	NAFO Conservation and Enforcement Measures
NLSE	Newfoundland and Labrador Shelf Ecozone
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRA	NAFO Regulatory Area
NSLTWG	Nova Scotia Leatherback Turtle Working Group

P1, P2, P3	MSC's Guiding Principles
PA	Precautionary Approach
PI	Performance indicator
PRI	Point of Recruitment Impairment
RAP	Regional Assessment Process
RV	Research Vessel
SARA	Species at Risk Act
SFF	Sustainable Fisheries Framework
SG	Scoring Guidepost
SSB	Spawning Stock Biomass
SURBA	SURvey BAsed model
TAC	Total Allowable Catch
UoA	Unit of Assessment
USR	Upper Stock Reference
VME	Vulnerable Marine Ecosystem
WWF	World Wildlife Fund

1. Executive summary

This report includes the details of the MSC pre-assessment for the Canadian fishery for cod in NAFO Divisions 2J3KL against the MSC Principles and Criteria for Sustainable Fishing. The report outlines the background, results of the assessment, the rationales that substantiate the scores for each performance indicator, and the recommendations of the assessment team for the client to move forward for a full assessment of the fisheries.

This pre-assessment was conducted by Dr. Ivan Mateo and James Baird and was carried out using the MSC Fisheries Certification Requirements v2 (Effective April 1, 2015).

Dr. Ivan Mateo (Lead Assessor)
Dr. Mateo has over 20 years' experience working with natural resources population dynamic modelling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Caribbean US Coast, Gulf of California, and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management group on bioenergetics modelling for Atlantic Cod. He also has been working as an environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats, as well as working for the Environmental Defence Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoctoral research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modelling of Alaska sablefish.

James Baird
Mr. Baird retired after a 35 year career with Fisheries and Oceans Canada (DFO) in January 2012. Since that time he has worked as a consultant dealing with fishery related issues. This provides him with more than 38 years' experience in fisheries science and management activities related to the commercial fisheries in Canada. Mr. Baird worked in science and management fields from a domestic, national and international perspective. For the first 15 years of his career at DFO he worked in the science sector, primarily as a senior fish stock assessment biologist. For the past 20 years at DFO, he was an Executive manager (mostly in Fisheries Management) and for the last 3.5 years of his career he was Regional Director General (RDG) in the Newfoundland and Labrador Region of DFO. As RDG he had executive responsibilities for various DFO sectors (Science, Oceans, Policy, Fisheries Management and Corporate Services). Mr. Baird was also the Head of Delegation for Canada at the Northwest Atlantic Fisheries Organization (NAFO) for 2.5 years prior to his retirement. As such he was Canada's chief negotiator for the determination of fish quotas and management measures for Northwest Atlantic Groundfish and shrimp fisheries. This required an extensive understanding of annual science assessments and ecosystem impacts (bycatch as well as fishery impacts on the ocean floor).

This assessment was conducted based on information and documents provided by the clients and available to the public. However, emails were exchanged and discussions occurred with individuals involved in science and management for clarifications, additional information and documents requests.

Recommendation
This pre-assessment found some deficiencies in Principle 1 that will need to be addressed prior to this stock proceeding to a full MSC assessment. The pre-assessment did not find any identified obstacles to be addressed in Principles 2 or 3 before proceeding to a full assessment.

Principle 1
The results show that the 2J3KL cod stock has been rebuilding with the Spawning Stock Biomass increasing regularly during the past 6 years. However the SSB is still well below the established Limit Reference Point for this stock. This SSB for this stock will need to be increased above the point where recruitment would be impaired and a rebuilding timeframe shall be specified for the stock for this fishery to be a candidate for MSC full assessment.

Some other deficiencies that have been identified for this fishery in Principle 1 are:

- There has not been a rebuilding timeframe determined for this stock;
- There is only a single reference point identified (LRP). No other reference points (e.g. upper stock, target or fishing mortality reference points have yet to be determined);
- While there is a single generally understood harvest control rule, there are no explicit harvest control rules based on various levels of SSB;
- There are currently no estimates of the recreational cod catch. This fishery uses a type of hand line gear that is different from the stewardship handline fishery. In the meantime scientists conclude that the current exploitations levels are low and removals from various fisheries have very little impact on stock population dynamics.

A rebuilding strategy for 2J3KL cod with a rebuilding timeframe that is the shorter of 20 years or 2 times its generation time, along with continued monitoring, will be required for this fishery to proceed to full MSC assessment. In addition, a full suite of precautionary approach reference points, the development of a series of well-defined Harvest Control rules and a process to determine estimates for the recreational catch will also be required for this fishery.

Principle 2
The pre-assessment indicates that there are no primary or secondary species for the fishery of 2J3KL cod. There was an issue with the evaluation of bait species as data was not provided on this issue by DFO.

There is sufficient information available to adequately determine there is minimal risk posed by the fishery on ETP species identified (spotted and striped wolfish and leatherback turtles). There is a strategy to effectively manage these species (Species at Risk log books, mandatory live release requirements with associated training, etc.). Information is also adequate to determine the risk posed to habitat types and ecosystems by the fishery and the effectiveness of the strategy to manage impacts on habitat types and ecosystems.

There is also evidence that the fishery is highly unlikely to reduce habitat structure, Vulnerable Marine Ecosystem (VME) habitats and ecosystem function to a point where there would be serious or irreversible harm. There have been several “Ecologically and Biologically Sensitive Areas” defined throughout the 2J3KL zone. In addition, 2 MPAs have been defined and the Canadian government has committed to protect up to 10% of the marine environment by 2020. The definition of the EBSAs is a precursor to this additional work in defining MPAs.

Principle 3

The main fisheries authority is the Canadian Department of Fisheries and Oceans (DFO). The Northwest Atlantic Fisheries Organization (NAFO) has authority for a small portion of Division 3L outside the Canadian 200 mile EEZ. Long term objectives to guide decision making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy. These are outlined through DFO's Sustainable Fisheries Strategy and in the development of Integrated Fishery Management Plans. A single fishery-specific objective is generally understood: that is the fishery removals (and exploitation rate) should be maintained at a low level to allow for continued rebuilding of this stock. There is a high level of compliance, control and surveillance (MCS) for the 2J3KL cod fishery.

Research is undertaken to achieve the objectives consistent with MSC's Principles 1 and 2, and research results are available to interested parties.

Overall Conclusion/Recommendation

On the completion of the analysis and scoring of the Canadian fishery for cod in NAFO Divisions 2J3KL against the MSC Criteria and Principles, using MSC FCR v.2.0, it is recommended that when this stock reaches the biomass limit (Blim) determined for this stock and additional work is completed (a full suite of explicit reference points and explicit harvest control rules are developed, an explicit rebuilding time frame <20 years is determined and an estimate of recreational catch developed), it can move forward to a full MSC assessment process.

2. Introduction

2.1 Aims/scope of pre-assessment

The pre-assessment of the Canadian fishery for cod in NAFO Divisions 2J3KL does not attempt to duplicate a full assessment against the MSC standard. A full assessment involves expert team members and public consultation stages that are not included in a pre-assessment. This pre-assessment provides a provisional assessment of a fishery based on a limited set of information provided by the client.

2.2 Constraints to the pre-assessment of the fishery

Most of the information used in the completion of this pre-assessment was obtained from the DFO National website (http://www.dfo-mpo.gc.ca/). References to specific webpages on this site are included.

There was also information obtained from discussions and e-mail exchanges with the client as well as with scientists and managers from Fisheries and Oceans Canada.

The last full stock assessment for this stock occurred in 2013 with the next full assessment scheduled for March, 2016. However, there were stock status updates available for 2014 and 2015.

2.3 Unit(s) of Assessment

The UoC (i.e., the unit entitled to receive an MSC certification) is defined as follows:

> "*The target stock or stocks (=biologically distinct unit/s) combined with the fishing method/gear and practices (including vessel type/s) pursuing that stock and any fleets, groups of vessels, or individual vessels of other fishing operators.*"

The UoA defines the full scope of what is being assessed and is therefore equal to or larger than the UoC. If it is larger, it means it will include "other eligible fishers".

The following Table shows the average catch in ten year periods from 1965-74 up to the present. The high average in the first period is a result of intensive fishing by non-Canadian vessels off the coast of Newfoundland and Labrador. The periods from 1975-84 and 1985-94 were fished by non-Canadian and Canadian fleets. The moratorium on the large scale commercial cod fishery was implemented in 1992 and resulted in catches that were very low compared to the earlier periods.

Table 1. Average Catch from 1965 to 2014 from Canadian and Non Canadian Fleets In metric tones.

Year Range	1965-74	1975-84	1985-94	1995-04	2005-14
Ave. Catch (000 t)	539.0	202.1	170.6	3.5	3.2

The gear types traditionally used in this fishery have been cod traps, gillnets, longlines, hand lines and otter trawls. Since 1992 the fishing gears utilized have been primarily gillnets, longlines and hand lines.

Accordingly, the current Canadian stewardship fishery for cod in NAFO Divisions 2J3KL is described as follows:

UoA 1: Canadian Stewardship Gillnet (GN) Fishery for Cod in NAFO Divisions 2J3KL

Species	**Atlantic Cod *Gadus Morhua***
Geographical Area	NW Atlantic, Canadian EEZ, NAFO NRA
Stock	NW Atlantic, Canadian EEZ, NAFO NRA
Method of capture	Gillnet
Management system	DFO/NAFO
Client Group and other eligible fishers	**Fish Food and Allied Workers/World Wildlife Fund All eligible fishers are part of FFAW.**

UoA 2: Canadian Stewardship Longline (LL) Fishery for Cod in NAFO Divisions 2J3KL

Species	**Atlantic Cod *Gadus Morhua***
Geographical Area	NW Atlantic, Canadian EEZ, NAFO NRA
Stock	NW Atlantic, Canadian EEZ, NAFO NRA
Method of capture	Longline
Management system	DFO/NAFO
Client Group and other eligible fishers	**Fish Food and Allied Workers/World Wildlife Fund All eligible fishers are part of FFAW.**

UoA 3: Canadian Stewardship Hand-line (HL) Fishery for Cod in NAFO Divisions 2J3KL

Species	**Atlantic Cod *Gadus Morhua***
Geographical Area	NW Atlantic, Canadian EEZ, NAFO NRA
Stock	NW Atlantic, Canadian EEZ, NAFO NRA
Method of capture	Hand-line
Management system	DFO/NAFO
Client Group and other eligible fishers	**Fish Food and Allied Workers/World Wildlife Fund All eligible fishers are part of FFAW**

It can be expected that when the fishery rebuilds to a healthy level that cod traps and otter trawls may be reintroduced into the fishery. Additionally, there has been experimentation with cod pots in recent years and there may be more activity using this gear type in the future.

2.4 Total Allowable Catch (TAC) and Catch Data

Table 2.1a TAC and Catch Data for the Cod Fishery in NAFO Divisions 2J3KL for the period 1959-1991. TAC/Catches '000 mt. Source: DFO.

TAC	Year	Total Catch	Canadian Catch	Non-Canadian Catch
	1959	359.6	164.0	195.6
	1960	467.8	164.7	303.1
	1961	505.1	124.0	381.1
	1962	507.0	142.9	364.1
	1963	509.2	149.0	360.2
	1964	602.6	141.5	461.1
	1965	545.0	117.9	427.1
	1966	524.5	119.1	405.4
	1967	611.8	115.5	496.3
	1968	810.0	123.3	686.7
	1969	753.7	115.6	638.1
	1970	520.3	91.2	429.1
	1971	439.5	74.5	365.0
	1972	458.3	66.4	391.9
666.0	1973	354.5	44.1	310.4
657.0	1974	372.7	36.1	336.6
554.0	1975	287.5	42.5	245.0
300.0	1976	214.2	63.0	151.2
160.0	1977	172.8	79.6	93.2
135.0	1978	138.6	102.4	36.2
180.0	1979	166.9	130.8	36.1
180.0	1980	175.8	147.6	28.2
200.0	1981	170.8	147.1	23.7
230.0	1982	229.8	207.5	22.3
260.0	1983	232.4	214.5	17.9
266.0	1984	232.5	202.7	29.8
266.0	1985	231.3	187.1	44.2
266.0	1986	266.7	199.1	67.6
256.0	1987	239.9	203.8	36.1
266.0	1988	268.7	241.9	26.8
235.0	1989	254.0	215.2	38.8
199.0	1990	219.5	193.3	26.2
190.0	1991	172.1	122.0	50.1

Table 2.1b TAC and Catch Data for the Cod Fishery in NAFO Divisions 2J3KL for the period 1992-2014. TAC/Catches '000 t. Source: DFO.

0.0	1992	41.0	26.1	14.9
0.0	1993	11.4	9.0	2.4
0.0	1994	1.3	1.3	0.0
0.0	1995	0.4	0.4	0.0
0.0	1996	1.9	1.9	0.0
0.0	1997	0.9	0.9	0.0
4.0	1998	4.5	4.5	0.0
9.0	1999	8.5	8.5	0.0
7.0	2000	5.5	5.4	0.1
5.6	2001	6.9	6.8	0.1
5.6	2002	4.3	4.2	0.1
0.0	2003	1.1	1.0	0.1
0.0	2004	0.6	0.6	0.0
0.0	2005	1.3	1.3	0.0
-	2006	2.7	2.7	0.0
-	2007	2.9	2.9	0.0
-	2008	3.3	3.3	0.0
-	2009	3.1	3.1	0.0
-	2010	3.0	2.9	0.1
-	2011	3.4	3.1	0.3
-	2012	3.4	3.3	0.1
-	2013	4.4	4.3	0.1
-	2014	4.7	4.6	0.1

Notes on Table 2.1b:
There were no quotas set for the stewardship fishery from 2006 to 2014. Fishers were permitted an allowance per license holder in each year (3,000 lb in 2006, 2,500 lb in 2007, 3,250 lb in 2008, 3,750 lb in 2009 to 2012, and 5,000 lb in 2013 and 2014). In addition, this table does not include Canadian recreational fisheries landings from 2007-2014.

Information from:
Brattey et. al., 2013
DF0 Website (www.dfo-mpo.gc.ca)
NAFO Website (www.nafo.int)

3. Description of the fishery

3.1 Scope of the fishery in relation to the MSC programme

Eligibility for Certification against the MSC Standard

The fishery is eligible for certification and able to be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing as:

- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- Fishing operations do not use destructive fishing practices such as fishing with poisons or explosives;
- The fishery applying for certification is not the subject of controversy and/or dispute;
- The fishery has not previously failed an assessment or had a certificate withdrawn;
- The Client Group is prepared to consider how other eligible fishers may share the certificate;
- There are no catches of non-target stocks that are inseparable or practicably inseparable (IPI) from the target stock;
- The assessment of the Canadian cod fishery in NAFO Divisions 2J3KL will not result in an overlapping assessment with other fisheries.

Eligible fishers

All fish harvesters who participate in the 2J3KL cod stewardship fishery are represented by the FFAW. These stewardship fish harvesters operate small inshore vessels (< 65') and fish close to land. There are also fleets of mid-shore (65'-100') and offshore (>100') vessels that operate in the 2J3KL area, however these vessels are not permitted to participate in the stewardship fishery.

Scope of Assessment in Relation to Enhanced Fisheries

The fishery under assessment is not an enhanced fishery.

Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The fishery under assessment is not an Introduced Species Based Fishery

3.2 Overview of the fishery (DFO Factsheet)

The Atlantic cod figured predominantly in the early colonization of North America. The Portuguese began fishing Newfoundland waters in 1501 and the French and Spanish Basques by the early 1500s. The English fishery was slower to develop in the New World than those of the French, Spanish and Portuguese. When it did, however, it provided a source of training in seamanship that bolstered the British Navy and later contributed to the English supremacy of the seas. (DFO factsheet - http://www.dfo-mpo.gc.ca/science/publications/uww-msm/articles/atlanticcod-morueatlantique-eng.htm)

Description

The Atlantic cod (*Gadus morhua*) is one of 59 species of the family Gadidae. At one time the cod family was the most numerous and best represented of fishes in the Canadian area. A marine fish which occurs mainly in cool waters in northern seas, the cod is soft-rayed, has three dorsal fins on its back and two anal fins behind its whitish-colored belly, and generally has an elongated hair-like projection called a *barbel* on its chin. It is generally grey or green but may be brown or reddish, depending upon the habitat into which its color will generally blend. The scales are small and smooth. The mouth is large with a projecting upper jaw and the gill openings are wide. The lateral line of the cod is pale, and the tail is slightly concave, almost square (DFO Factsheet - http://www.dfo-mpo.gc.ca/science/publications/uww-msm/articles/atlanticcod-morueatlantique-eng.htm).

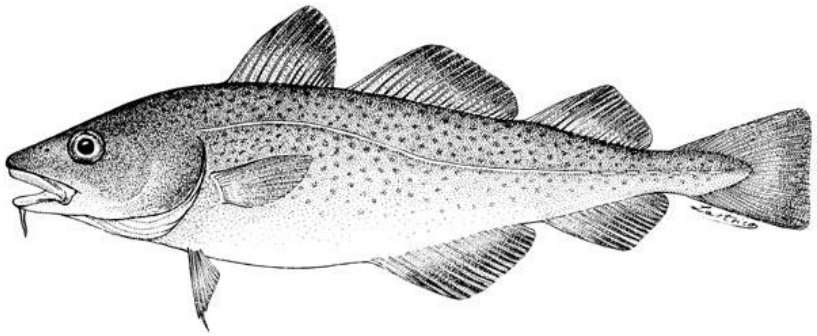


Figure 1. *Atlantic cod, Gadus morhua (Linnaeus, 1758).*
Source: http://www.fao.org/fishery/species/2218/en

Distribution and Migration

Historically much of the northern cod stock was highly migratory. They over-wintered near the edge of the continental shelf and migrated in spring/summer to shallow waters along the coast and onto the plateau of the Grand Bank (DFO 2013c). By the mid-1990s these offshore over-wintering populations were barely detectable, but at the same time, there were aggregations of cod in the inshore in Div. 3L and southern Div. 3K. These inshore populations appeared to be more productive during the 1990s than those in the offshore. Inshore populations were small relative to the populations that historically migrated into the inshore from the offshore during spring/summer. (DFO 2013c)

Tagging studies revealed that during the late 1990s to the mid-2000s the inshore of Div. 3KL was inhabited by at least two groups of cod: (1) a resident coastal group that inhabited an area from eastern Trinity Bay northward to western Notre Dame Bay (Fig. 3.1); (2) a migrant group that over-wintered in inshore and offshore areas of Subdivision 3Ps, moved into southern Div. 3L during late spring and summer, and returned to Subdivision 3Ps in the autumn. Tagging studies also indicated considerable movement of cod among Trinity Bay, Bonavista Bay, and Notre Dame Bay.

The status of cod in the offshore has improved in the past decade and the shoreward seasonal migration pattern observed prior to the moratorium did take place during recent years. Overwintering inshore aggregations, such as those observed in Smith Sound, Trinity Bay, have diminished and most of the stock now appears to overwinter in the offshore, similar to the pre-moratorium period. The offshore biomass of cod in Div. 2J3KL was low but increased during 2003-2014; the current contribution of offshore cod to the inshore biomass during summer is likely substantial.

Age and Growth

Cod off Labrador and eastern Newfoundland grow slowly compared with individuals in the eastern Atlantic, the Flemish Cap (Div. 3M), and further south in the western Atlantic. Since the late 1980s females have been maturing at about age 5, which is younger than in previous years (DFO 2013c).

Feeding

Small cod tend to feed on small crustaceans; medium-sized cod feed on larger crustaceans and small fish; and large cod feed on medium-sized fish and crabs. Capelin (*Mallotus villosus*) in particular has historically been an important part of the annual diet (DFO 2013c, DFO 2015a).

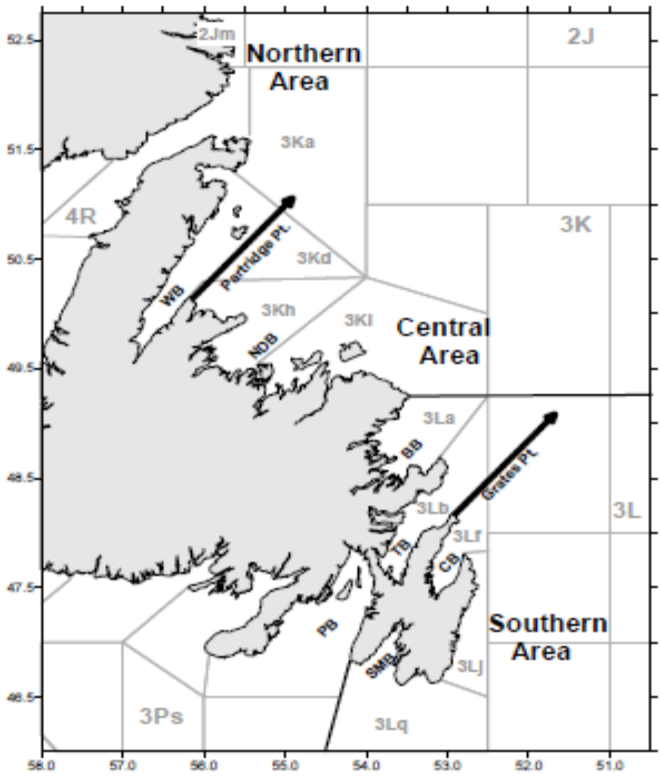


Figure 2. *Eastern Newfoundland indicating the locations of the inshore northern, inshore central and inshore southern areas. Major bays are indicated: White Bay (WB), Notre Dame Bay (NDB), Bonavista Bay (BB), Trinity Bay (TB), Conception Bay (CB), and St. Mary's Bay (SMB); Placentia Bay (PB) is in Subdivision 3Ps. Grey lines delimit boundaries of statistical unit areas (i.e., 3Ka, 3Kd, etc.).*

Overview of the Fishery

The cod fishery at Newfoundland by European ships began almost immediately after the discovery of the New World. It is reported that prior to 1550 there were 128 fishing vessels sailing to Newfoundland (DFO Factsheet - http://www.dfo-mpo.gc.ca/science/publications/uww-msm/articles/atlanticcod-morueatlantique-eng.htm). This fishery continued to expand both at Newfoundland and all along the Atlantic coast wherever cod were plentiful. By the late 1600s the catch of cod at Newfoundland had reached almost 100,000 metric tons (t) per year. By the late 1700s the catch had reached as high as 200,000 t annually. The cod landings during the 1800s ranged between about 150,000 and 400,000 t annually.

Catches of northern cod (2J3KL) increased from just over 300,000 t in the late 1950s to a peak of over 800,000 t in 1968, declined steadily to a low of 140,000 t in 1978, increased to about 240,000 t through much of the 1980s, and then declined rapidly in the early 1990s in advance of a moratorium on directed fishing in 1992 (Fig. 3.) (DFO 2013c).

Landings during 1993-1997 came from by-catches, food/recreational groundfish fisheries, and DFO-industry sentinel surveys that started in 1995. In addition, landings from 1998 to 2002 also came from a limited index/commercial inshore fishery restricted to fixed gear and small vessels (<65 ft). The directed commercial and recreational fisheries were closed in April 2003; most of the landings in 2003 came from an unusual mortality event in Smith Sound, Trinity Bay. During 2004 and 2005, substantial by-catches (>600 t) of cod were taken in the inshore, mostly in Div. 3KL, in the Winter Flounder (blackback; *Pseudopleuronectes americanus*) fishery.

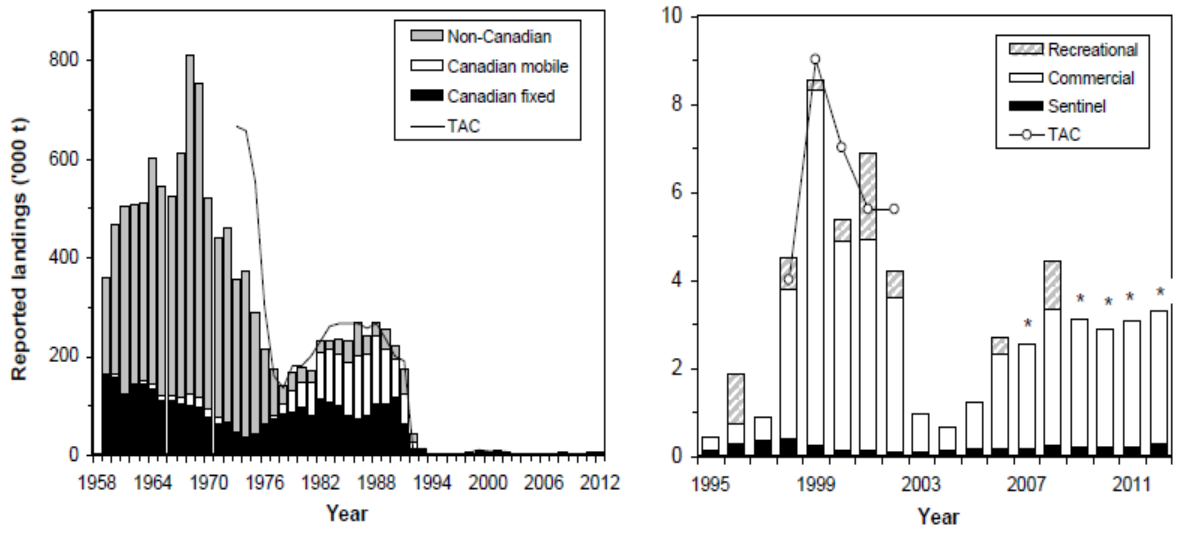


Figure 3. *Total Allowable Catches (TACs) and landings (thousands of tons) in 1959-2012. The right panel is expanded to show trends from 1995 onwards. Asterisks indicate that recreational catches in 2007 and 2009-2012 are unknown. Information for 2013 and 2014 are shown in Table 2.4b.*

A stewardship fishery for cod and a recreational groundfish fishery were re-opened in the inshore in 2006 and continued in 2007-2014. Commercial fishers were permitted a fixed annual allowance of cod per license holder ranging from 2,500 lb to 3,250 lb during 2006-2008, 3,750 lb during 2009-2012 and 5,000 lbs in 2013 and 2014. Reported landings in 2014 were 4,583 t. This included 4,290 t in the stewardship fishery, 275 t in the sentinel surveys, and 18 t taken as by-catch, but excluded recreational removals. There are no direct estimates of recreational cod landings for 2012-2014; therefore, total catch in these years is unknown. However, evidence from tagging data shows that the removals by the recreational fishery are substantial (>50 % of the stewardship fishery landings) in recent years. In addition, mean lengths of cod sampled at the dock during the 2008-12 recreational fisheries were generally higher than those sampled at sea, indicating widespread discarding of small fish during recreational fisheries.

The Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO) reported that the annual catch of cod by non-Canadian fleets outside the 200 nautical mile limit on the Nose of the Grand Bank (Div. 3L) were 80 t or less during 2000-2010, 292 t for 2011 and just over 130 t for each of 2012, 2013 and 2014. This non-Canadian catch was taken as bycatch in directed fisheries of other species.

In 1973 the major cod stocks, and in 1974 all of the cod stocks in the Northwest Atlantic and in particular those of the Canadian area, were placed under quota regulation. The Total Allowable Catch (TAC) for each stock was based upon scientific advice presented to the International Commission for Northwest Atlantic Fisheries (ICNAF) which later became Northwest Atlantic Fisheries Organization (NAFO).

The TACs at first were not effective in curbing overexploitation partly because the TACs were established at too high a level and partly because enforcement was not effective, and catches exceeded them in many cases. With the introduction of the 200-mile limit in 1977, the setting and enforcement of TACs in Canadian waters became a Canadian responsibility.

With added policing and more conservative TACs the stocks, within the Canadian zone, especially the northern cod stock (2J3KL), increased in abundance and commercial catch rates increased to levels approaching those of the 1960s. It was concluded in the late 1980s by the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) that the northern cod stock had tripled in size between 1976 and 1986. However, it was also concluded that the recent fishing mortalities were twice as high as had been estimated from previous assessments, so that the actual stock size, while increasing, had not increased as rapidly as thought. The lower stock size, coupled with lower recruitment in recent years, suggested that the TAC on this stock should be reduced. The results of an independent inquiry for this stock confirmed CAFSAC's assessment.

The Fixed Gear Fishery

A substantial portion of the harvest of 2J3KL cod came from inshore fixed gear fish harvesters (Table 3.2). The fixed gears utilized have been cod traps, gillnets, longline and hand line. During the period from 1975-1992 these catches have been dominated by cod trap and gillnets with average catches during this period of 32,225 t and 29,884 t, respectively, about three times higher that catches using longlines and hand lines (Table 3.1). The overall catches declined substantially, as expected, after the moratorium in 1992. While gillnets remained an important gear type in the index, stewardship, sentinel and other small fisheries, the hand line has also been more prominent. The landings from cod traps and longlines in the most recent period have been quite low.

Table 3.1. Average catches of specific fixed gears prior to and after the moratorium was established in 1992 for Cod in Divisions 2J3KL

	trap	gillnet	longline	handline
1975-1992 average	32225	29884	7491	11739
1993-2014 average	49	2167	90	1112

Table 3.2. Fixed gear landings of cod by Newfoundland and Labrador fish harvesters from Divisions 2J3KL from 1975 to 2014 (Source DFO).

	Trap Total	Gillnet Total	LL Total	HL Total	FG total
1975	15694	18501	2206	4812	41213
1976	26482	22519	3628	7310	59939
1977	33774	22539	4922	11388	72623
1978	37419	23844	8816	11376	81455
1979	25650	30625	15611	13943	85829
1980	30282	36194	17657	12390	96523
1981	18022	34363	17857	9838	80080
1982	45127	46987	11919	9027	113060
1983	40050	39605	7236	19541	106432
1984	38678	35463	6702	16801	97644
1985	39877	19834	5849	14325	79885
1986	34597	25295	4156	9454	73502
1987	27806	36870	5146	10385	80207
1988	44316	39657	5211	13153	102337
1989	38866	44998	5666	13723	103253
1990	46975	46026	9036	15250	117287
1991	35236	13351	3191	9184	60962
1992	1200	1234	27	9401	11862
1993	14	130	90	8731	8965
1994	6	46	22	1238	1312
1995	48	272	72	21	413
1996	107	519	61	1184	1871
1997	128	579	105	53	865
1998	55	2461	534	1450	4500
1999	49	7569	184	724	8526
2000	78	4084	232	960	5354
2001	203	3643	201	2833	6880
2002	130	2796	60	1206	4192
2003	0	179	8	781	968
2004	0	626	7	0	633
2005	0	1316	12	1	1329
2006	5	1865	79	673	2622
2007	6	1912	36	964	2918
2008	6	2705	52	577	3340
2009	0	2318	67	710	3095
2010		1993	40	620	2653
2011		2392	34	460	2886
2012		2740	35	354	3129
2013		3575	19	437	4031
2014		3945	25	493	4463

During the recent few years there has been a small emerging cod pot fishery in the area around Fogo, Newfoundland. This fishery has been focused on landing live cod to enhance the quality of catch for marketing purposes. To date, most of this catch has been sold directly to a local restaurant.

DFO could not provide recent catches for cod pots or cod traps because of confidentiality issues. Confidentiality concerns arise if the numbers of fishers, buyers or vessels utilized in a specific component of a fishery are low (≤ 5). In the meantime the use of both these gear types has been quite limited with associated landings being very low. Other sources have indicated that the total cod catch from cod pots (pers. comm. Fogo officials) for the 2011-2015 period has been 59 t, while the catch for cod traps (pers. comm. DFA officials) has been 33 t for 2013-2014.

Bratty (2013) reported on the level of tagging-induced mortality (the fraction of tagged cod that die due to the stress of capture, handling, and release) from various methods, such as retaining tagged cod in submersible enclosures, comparing recapture rates of cod tagged with various gears (Brattey and Cadigan 2004), as well as releasing batches of cod with surgically implanted acoustic transmitters and monitoring survival using moored acoustic receiver arrays (Brattey et al. 2008). Brattey and Cadigan (2004) found that tagging mortality was low (0.03) during spring (April-May) and higher (0.22) during late summer and fall (August-November) for cod caught with hand-line and otter trawl in shallow water, based on cage retention experiments. Acoustic telemetry also confirmed the high survival rates of cod caught for tagging in shallow water during early spring when no thermocline was present. Brattey et al. (2008) found > 96% survival (N=166) for cod tagged with external t-bar tags and implanted with acoustic transmitters. Therefore, seasonal estimates of tag-induced mortality were used in more recent analysis (Brattey 2013) based on the month of release, capture gear, and capture depth. A value of 0.03 was used for tagged cod captured with hand-line or cod pot at depths < 90 m and released during November-December and January-June, and a value of 0.22 was for those released during July-October.

It should be noted, however, that regulations for the stewardship cod fishery in 2J3KL (like most other fisheries in Atlantic Canada) require the mandatory landing of all catch. There are exceptions where the live release of some ETP species as well as the live release of undersize Atlantic Halibut are permitted. This regulation results in very low discards of cod in the stewardship fishery.

Sentinel Fishery

The cod sentinel survey is a longstanding fisheries science program in which inshore fish harvesters, in collaboration with DFO scientists, collect data on Atlantic cod (*Gadus morhua*). Prior to the cod moratorium, stock status assessments were based on data from the RV index and from offshore fisheries. Limited fishing data was incorporated from the inshore. The cod sentinel program was designed, in part, to address this information gap (Maddock-Parsons 2014).

The objectives of the cod sentinel program are:

- To develop a catch rate series for use in resource assessments;
- To incorporate the knowledge of inshore fish harvesters in the resource assessment process;
- To describe the temporal-spatial distribution of cod in the inshore area over a number of years through, for example, the use of catch rate information, tagging studies, by-catch information and fish harvesters' observations;
- To gather length frequencies, sex and maturity data and sample ages for use in resource assessment;

- To establish a long-term physical oceanographic and environmental monitoring program of the inshore areas; and
- To provide a source of biological material for other researchers, such as tissue for genetic, physiological and toxicological analyses, cod stomachs for food and feeding studies and by-catch information.

As part of the cod sentinel program, trained harvesters fish under systematic, well-defined and rigorous scientific protocols to gather information on stock abundance trends. Sentinel harvesters sample designated inshore areas. There are currently 45 designated fishing areas or sites along the coast of Newfoundland and Labrador.

A fixed (control) location on the fishing grounds was established for each site and will remain fixed for the duration of the project. Each fishing day, up to half of the gear was set at the control site. The remainder of the gear (experimental) was set at one or two other locations on the fishing grounds at the discretion of the crew. The location of each fishing set, and the time of the set and the soak time for the gear were recorded. Other environmental observations were noted, including wind direction and speed, percent cloud cover, tide conditions, presence of invertebrates (bait) and other fish species in the area, marine mammals, sea birds and any other variables which might have influenced fishing behavior.

This program has garnered considerable support from industry. It has led to better understanding and more confidence in assessments using sentinel data, better communication, collaboration and trust between fish harvesters and government scientists, and has provided opportunities to train harvesters in scientific protocols. Furthermore, from a scientific perspective, the sentinel surveys are being conducted in areas where conventional trawl surveys cannot operate and have been the only source of abundance indices for some stock units over the years.

The intent of the program was to continue inshore fishing at traditional times in an area established through traditional knowledge. These areas are mostly shore-ward of the DFO RV survey. Various fishing gears were used at different sites, including: Gillnets, (mesh-sizes of both 5.5 inches and 3.25 inches have been used), longlines, cod traps, and hand lines. The smaller mesh gillnet is deployed attached to the commercial-sized 5.5 inch mesh, and the intent was to capture smaller cod to provide data on cod recruitment. Cod traps were phased out over time, and were not used in the Sentinel Survey after 2002. Hand lines were used mostly in conjunction with nets or trawls as a means of acquiring cod for tagging purposes or determining presence of cod when nets were not catching fish.

Catches from control and experimental gear were measured for length and sex (i.e. 100% measured). Otoliths were sampled on a fish length-stratified basis to provide a means to study age and growth. Selected sites were instructed to collect a length-stratified sample of up to 100 frozen fish on a biweekly basis for detailed biological sampling by DFO technical staff at the Northwest Atlantic Fisheries Centre. Weight analysis measurements were taken on these samples

Sentinel catches were aged using the aging information collected at selected sites distributed across the inshore of 2J3KL. Distinct age-length keys were compiled for specific areas within a NAFO Division. The age range encountered by specific gear type were: Long line – Ages 3-9; 5.5 inch Gillnet – Ages 3-10; and 3.25 Inch Gillnet – Ages 2-10.

Management

Fisheries and Oceans Canada (DFO) utilizes Integrated Fisheries Management Plans (IFMPs) to guide the conservation and sustainable use of marine resources (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp). An IFMP is developed to manage the fishery of a particular species in a given region. IFMPs combine the best available science on a species with industry data on capacity and methods for harvesting that species. These plans include:

- ***A Fishery Overview***
  Including: a brief history of the fishery, the type of fishery, participants, location of the fishery, fishery characteristics (gear type, seasons, other measures), legislation and regulation and the approval process.
- ***Stock Assessment, Science and Traditional Knowledge***
  Including: a biological overview, ecosystem interactions, Aboriginal Traditional Knowledge/Traditional Ecological Knowledge (ATK, TEK), stock assessment summary, stock prospects, precautionary approach details, ongoing research and research gaps.
- ***Economic, Social and Cultural Importance of the Fishery***
  This includes a brief overview of economic conditions and social, cultural and economic issues.
- ***Management Issues***
  To include: potential gear conflicts, by-catch issues, catch monitoring, depleted species concerns, oceans and habitat considerations, gear impacts and international issues.
- **Objectives**
  Development of long-term objectives related to: stock conservation, the ecosystem, stewardship, social/cultural/economic issues and compliance.
- **Access and Allocation**
  Decisions on sharing arrangements and as well as quotas and allocations are included here. The Fisheries Minister can, for reasons of conservation or for any other valid reasons, modify access, allocations and sharing arrangements as outlined in an IFMP in accordance with the powers granted pursuant to the *Fisheries Act.*
- **Management Measures for the Duration of the Plan**
  Specific management measures are outlined here: Total Allowable Catch (TAC), Fishing Seasons/Areas, Control and Monitoring of Removals (measures to control and monitor both target and by-catch species in commercial, FSC, bait, recreational and other fisheries), gear restrictions and limits, observer coverage, dockside monitoring, logbooks, hailing, VMS, by-catch protocols, discarding protocols, small fish/soft-shell protocols, conservation harvesting techniques and selective fishing requirements. Where relevant, includes any mandatory financial arrangements required with fish harvesters and other stakeholders. Decision rules, species at risk requirements, licensing issues and habitat protection measures are also included.
- **Shared Stewardship Arrangements**
  Highlight any shared stewardship arrangements, including increased shared decision-making.
- **Compliance Plan**
  Includes: Conservation and Protection Program Description, Regional Compliance Program Delivery, description of compliance consultation, compliance performance, a list of current compliance issues as well as a description of the compliance strategy.
- **Performance Review**
  Outline indicators that will be used to determine if the plan objectives are met. These may include indicators specifically developed for this plan, as well as other existing tools. The results of the previous year's review (including landings, values, etc. where appropriate) should also be provided.

DFO has developed a series of policies that are published on their website to assist the development of these IFMPs:

More specifically, DFO is implementing and developing a number of tools and policies to address those factors outlined above. Many of this policies are components of DFOs Sustainable Fisheries Framework (SFF) and include:

- A Fishery Decision-Making Framework for Incorporating the Precautionary Approach;
- Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework: Growing Stocks out of the Critical Zone;
- A Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas;
- Ecological Risk Assessment Framework for Coldwater Corals and Sponge Dominated Communities;
- A Policy on New Fisheries for Forage Species;
- A Policy on Managing By-catch; and
- A Fisheries Checklist to help DFO self-assess progress towards sustainability, identify gaps in knowledge and practices, and to report externally on performance and progress towards sustainable management of fisheries.

The last complete IFMP for Groundfish in 2J3KL was produced in 2013. As the IFMP is a multi-year plan, quotas may change due to harvest control rules. Specific management measures like quota allocations, seasons, gear type and quantity are announced annually and are posted on the DFO Fisheries Management Decisions website.

The **2015 Fisheries Management Decision** for the 2J3KL Cod Stewardship Fishery by-catch fishery is summarized as follows:

Species and Area: Cod in NAFO Divisions 2J3KL

Dates of season (subject to change): Determined in consultation with the fishing industry

Total Allowable Catches and Sharing Arrangements: Individual quota (IQ) of 5000 pounds round weight available to fish harvesters with vessels < 65' with a homeport in 2J3KL. This IQ is intended to cover all directed and by-catch of Cod for all groundfish fisheries in the fishing season.

Management Measures: Management measures for this fishery will be in place for three years (2013-2015). These will include:

Logbooks: It is very important for fish harvesters to return their completed logbooks to DFO at the end of the fishery.

In addition to the Management Decisions that are determined by the Minister of Fisheries and Oceans, there are other measures that are negotiated between DFO and fish harvesters (primarily seasons). These measures are included in **Conservation Harvesting Plans** (CHP). A summary of the CHP measures for 2014 and 2015 for 2J3KL cod included:

Areas of fishing: Groundfish licence holders will be required to harvest their cod IQ within the respective cod fishing area (fa) of their homeport.

Fishing restrictions: Fishing for cod will not be permitted outside Canada's Territorial Sea (the 12-mile

limit). If an area is closed to fishing, fishers will not be permitted to harvest their Individual Quota (IQ) in another, open area.

Season: All fishing Areas will have a three week season (For 2015 a 3-week period in a time between July 26 and September 30).

Fishing gear

- **Gillnets:** A maximum of 6 nets of 50 fathoms each with a minimum of 5 1/2 inch mesh size and a maximum 6 1/2-inch mesh size will be permitted. Gillnets may not be left unattended in the water for more than 48 hours.
- **Longlines:** The maximum number of hooks permitted is 2,000.
- **Hand lines:** One hand line is permitted. A hand line fishing method is defined as a single-line to which a weight and a maximum of six, single baited or feathered hooks are attached. Jiggers and jigging are not permitted.
- **Cod Pots:** A maximum of 15 Cod pots may be used. The dimensions of each Cod pot shall be no more than two meters by two meters by one meter high constructed of 5/8 round stock steel as the frame with the exterior netting having a mesh size of 100 mm.

Small Fish Protocol: The minimum size for Cod is 45 cm. Areas will be closely monitored and will be closed to fishing when the number of Cod <45cm long caught exceeds 15% of the total number of Cod caught.

Mandatory Landing: All groundfish caught, with the exception of those mentioned in 2015 Groundfish General Conditions, and those species listed under the *Species at Risk Act* (Northern and Spotted wolfish) must be landed. No discarding at sea is permitted.

Reporting and Monitoring: It is mandatory that fishers accurately complete and submit their respective log book. The Dockside Monitoring Program will apply to all landings, including all fish intended for personal use. Fishers will be required to land their catch at designated ports. The use of a Vessel Monitoring System (VMS) is required for all vessels 35 ft. LOA and greater.

By-catches: Fishers will be restricted to 10% or 200lbs by-catch, whichever is greater, of any species that is incidental to the directed species. Incidental catch will be calculated as a percentage of the total directed species retained onboard. All cod caught, from any fishery in NAFO Divisions 2J3KL during the current management period, whether directed or incidental, will be charged against the IQ of the license holder. If a fisher exceeds their cod IQ level in another fishery, he/she will not be permitted to participate in the cod fishery.

Marine protected areas: There will be no fishing activity in any designated Marine Protected Areas (MPA), including Gilbert Bay in southern Labrador and Duck Island/Round Island near the Eastport Peninsula.

Species at risk act: Fishers will be required to release Northern and Spotted wolfish that are listed under SARA, as per licence conditions.

History of Stock Assessments

The International Commission for the Northwest Atlantic (ICNAF) was among the first regional fisheries management bodies to be established in the world with its first meeting being held in 1951

(http://www.nafo.int/about/frames/about.html). ICNAF had a lead role in the formulation of fishery management techniques in the 1950s and 1960s. However an extensive expansion of long distance fleets during this period had a lasting effect on the fishery resources in the northwest Atlantic.

In the late 1960s ICNAF developed scientific techniques necessary to determine stock status and recommend catch levels intended to attain sustainability. However, many stocks were already in decline. Effort, already excessive, continued to build as existing fleets expanded, new fleets joined the fishery and fishing by non-member countries of ICNAF increased. The required management actions based on the scientific advice was slow to follow. The first analytical assessments were carried out in 1969 on cod and haddock by the ICNAF Assessment Committee.

The first TAC for 2J3KL cod of 666,000 t was established for the 1973 fishing year. The catch that year just over 350,000 t. For the next three years the TAC remained high and it wasn't until 1977 that the TAC and catches were better aligned. However, by this time the cod stock had been depleted.

ICNAF was replaced by a new Convention in 1979, following the extension of national fisheries jurisdiction by the Coastal States to 200 nautical miles. ICNAF was replaced by the Northwest Atlantic Fisheries Organization (NAFO), established under the new Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries. Scientific work to be completed by NAFO was mandated to its Scientific Council.

When Canada extended its jurisdiction to 200 miles in 1977 the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) was established. From the late 1970s to the early 1990s stock assessments for 2J3KL cod were completed by either NAFO or CAFSAC subcommittees or sometimes both.

Early assessments conducted by NAFO or CAFSAC for 2J3KL cod were based on Catch per Unit Effort (CPUE) data because of the absence of Research Vessel (RV) surveys covering the entire stock area. Random-stratified surveys in NAFO Division 3L began in the early 1970s, however RV surveys in Divisions 3K and 2J did not begin until the late 1970s. As the time series of these RV surveys became longer they became the key indicator of stock status.

The assessment technique employed throughout most of the 1980s was the bulk biomass method. This entailed a comparison of total, all ages combined, CPUE or later of RV survey biomass estimated with biomass estimated from virtual population analyses (VPA) over a range of terminal fishing mortalities. It was not until the late 1980s that age-structured population models were used.

In 1993, after the collapse of cod fishery in 2J3KL and the closure of other key groundfish fisheries in the Northwest Atlantic, DFO discontinued CAFSAC and established the Fisheries Resource Conservation Council (FRCC). The FRCC was comprised of members of academia, the fishing industry and DFO. DFO scientists would conduct stock assessments and present results publically. The FRCC would then conduct public consultations based on available scientific analyses and include views from the fishing industry and others and eventually making recommendations to the DFO Minister on appropriate harvest levels and management measures.

The FRCC was discontinued in 2011. At present stock assessments are conducted at Regional Assessment Processes (RAPs) within the DFO administrative regions. The 2J3KL cod stock assessment is conducted at a RAP in the Newfoundland and Labrador Region with participation from DFO Science and Management, academia and the fishing industry. The Minister is provided advice from this process for the determination of management strategies. The full assessment process for 2J3KL cod

occurs every 3 years with stock assessment updates occurring in the intervening years. The last full assessment was conducted in 2013 with the next assessment scheduled to occur in March, 2016.

Market Information

Cod exports in all areas of Newfoundland and Labrador were valued at $13.6 million for the first 11 months of 2014, up 36.9 per cent from the same period in 2013. The United Kingdom and the United States were the largest export destinations for Newfoundland and Labrador cod, representing 48.6 per cent and 39.4 per cent of total cod export value respectively.

Market Information from: *Seafood Industry Year in Review 2014*
Province of Newfoundland and Labrador
Department of Fisheries and Aquaculture

3.3 Principle One: Target species background

Stock assessment

The last full assessment of the cod stock in NAFO Divisions 2J3KL was conducted in 2013 (DFO 2013c). Stock assessment updates were provided in 2011, 2012, 2014 and 2015 (DFO 2011b, DFO 2012b, DFO 2014 a, DFO 2015d) with the next full assessment to occur in March 2016.

Abundance Indices – 2015 Stock Assessment Update

Bottom-trawl surveys. The abundance and biomass indices from the autumn DFO RV surveys have been low since the start of the moratorium in 1992 (Fig 4). The abundance index increased during 2005-09 and the biomass index increased during 2005-08; these increasing trends did not persist during 2009-11, but have resumed during 2012-14. Most of the abundance (81%) and biomass (76%) is located in the northern portion of the stock area (Divs. 2J and 3K). The recent (2012-14) upward trend in the abundance index is mostly due to increased numbers of small cod (≤ age 3). The three-year averages (2012-14) for the abundance and biomass indices are 18% and 19%, respectively, of the average during the 1980s.

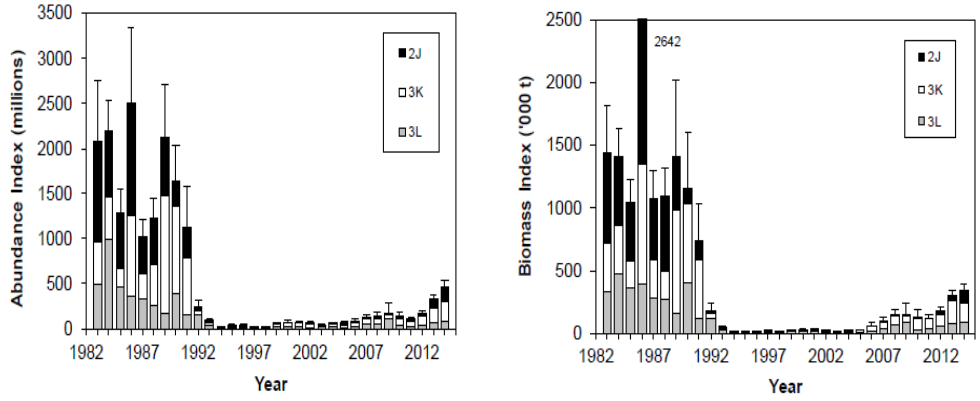


Figure 4: *Offshore biomass and abundance indices (+2 SE's) from autumn RV surveys in Divs. 2J3KL*

A cohort analysis of the autumn research vessel survey data (SURBA; **SUR**vey **BA**sed model) is used to produce estimates of spawning stock biomass (SSB). The SSB index from the autumn DFO RV survey declined rapidly in the late 1980s and early 1990s, and remained very low for over a decade after the 1992 moratorium. After 2005 the SSB index shows an upward trend (Fig. 5). With the inclusion of the most recent information, the three-year average SSB index increased from 19% of the LRP in 2011-13 to 26% in 2012-14 and, although improving, SSB remains in the critical zone.

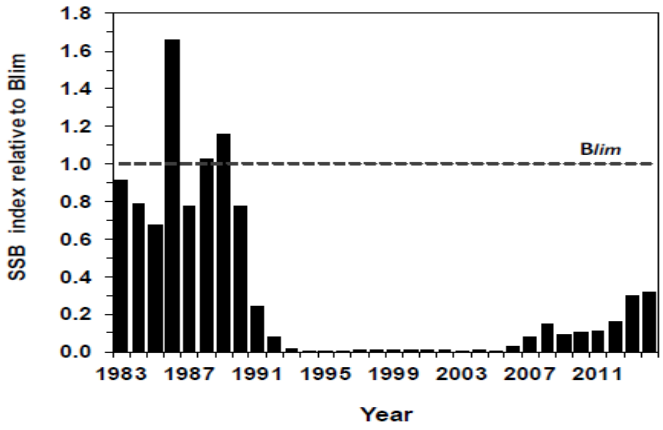


Figure 5. *SSB index from autumn DFO RV surveys in Divs. 2J3KL. The dashed line is the Limit Reference Point (Blim) which is defined as the average SSB during the 1980s.*

Information on recruitment (ages 3-4) and mortality is derived from mean catch rate at age during the autumn DFO RV surveys.

Recruitment in the offshore in the 1990s and 2000s has been poor compared to the 1980s (Fig. 6). The number of recruits in the autumn DFO RV survey in the 1990s has consistently been much lower than during the 1980s, but improved slightly in year-classes from 2002 onwards. The 2011 year-class in the 2014 survey is the strongest observed at age 3 in the post-moratorium period. The numbers of this year-class at age 3 in 2014 correspond to about one third of the average numbers of age 3s.

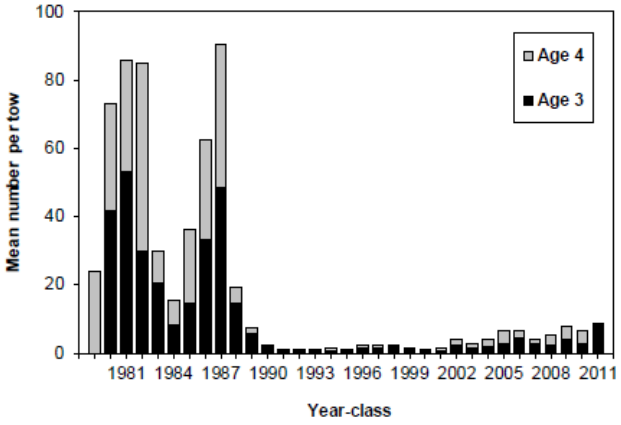


Figure 6. *Abundance of the 1979-2011 year-classes at age 3 and/or age 4 in the offshore of Divs. 2J3KL from the autumn RV surveys.*

The total mortality rate (*Z*, ages 4-6) was low in the 1980s, but was at a high level (*Z*>0.6, i.e., >45% per year) from the early 1990s to the mid-2000s, with peaks during the early 1990s and early 2000s (Fig. 7). This high level of mortality during much of the post-moratorium period has been a major impediment to stock recovery. Total mortality shows a general decline after 2003, except during 2010 and 2011. The three-year average mortality rate during 2012-14 was 0.06 which corresponds to only 6% mortality per year. In recent (2011-13) surveys, several cohorts have shown increasing numbers among older ages which is not biologically possible. This indicates that one or more of the 2011-13 surveys, and the three-year average Z for 2012-14, may be influenced by year effects.

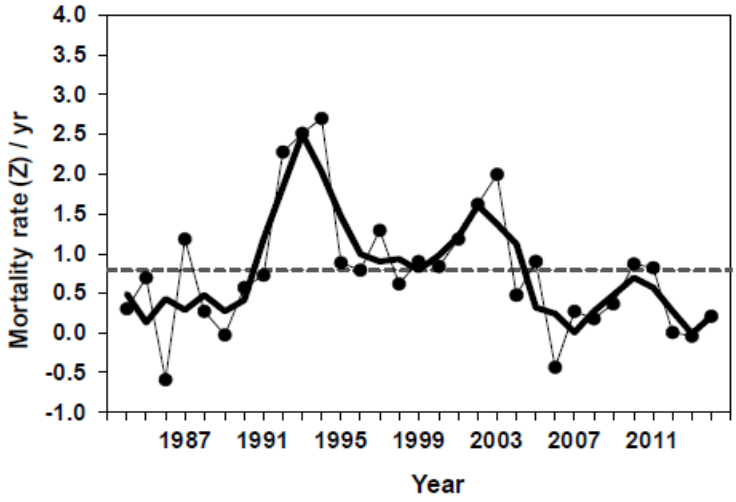


Figure 7*: Total mortality rate (Z) of cod aged 4-6 calculated using data from the autumn RV surveys in the offshore of Divs. 2J3KL. For example, the value in 1996 is the mortality experienced by the 1991-1989 year-classes from ages 4-6 in 1995 to ages 5-7 in 1996. The dashed line is the time-series average (Z=0.79 which corresponds to 55% mortality per year). The thick solid line is the 3-yr running mean.*

Sentinel Catch Rates – Inshore. The inshore was divided into three areas for the analysis of sentinel catch rate data:

(1) a northern area (2J and northern 3K);

(2) a central area (southern 3K and northern 3L); and

(3) a southern area (southern 3L) that is partly dependent on migrant fish from 3Ps and possibly other offshore areas.

The dividing lines for these areas are Partridge Point at the western side of Notre Dame Bay and Grates Point at the eastern side of Trinity Bay (Fig. 8).

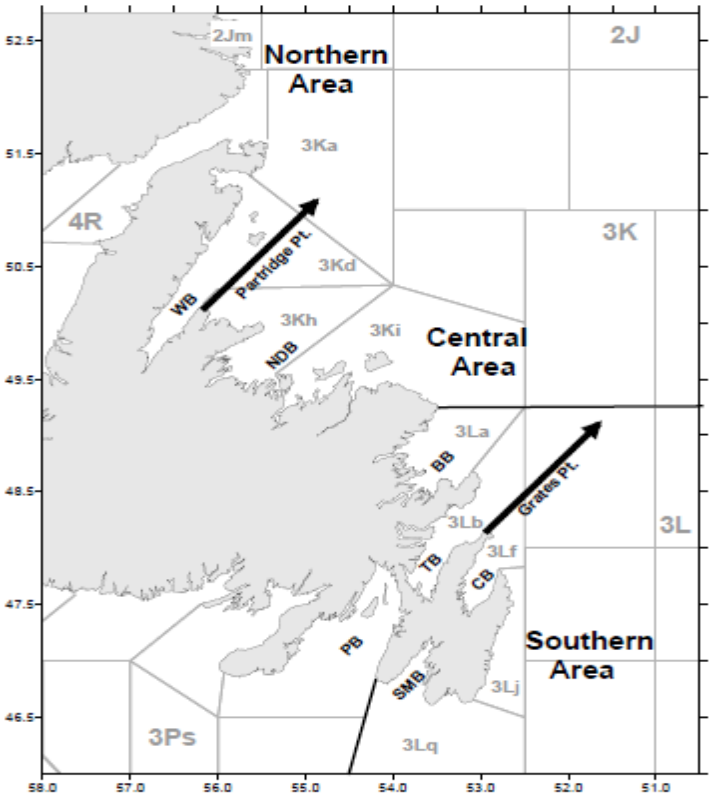


Figure 8. *Eastern Newfoundland indicating the locations of the inshore northern, inshore central and inshore southern areas. Major bays are indicated: White Bay (WB), Notre Dame Bay (NDB), Bonavista Bay (BB), Trinity Bay (TB), Conception Bay (CB), and St. Mary's Bay (SMB); Placentia Bay (PB) is in Subdiv. 3Ps. Grey lines delimit boundaries of statistical unit areas (i.e., 3Ka, 3Kd, etc.).*

Sentinel survey mean catch rates are preliminary as ageing of samples from the 2014 sentinel fishery was not complete. Catch rates increased in the northern and central areas during 2012-14. Catch rates are well above the respective time series (1995-2014) average in the northern and central areas, but close to average in the southern area (Fig. 9). Recent catch rates are much lower in the southern area compared with the northern and central areas.

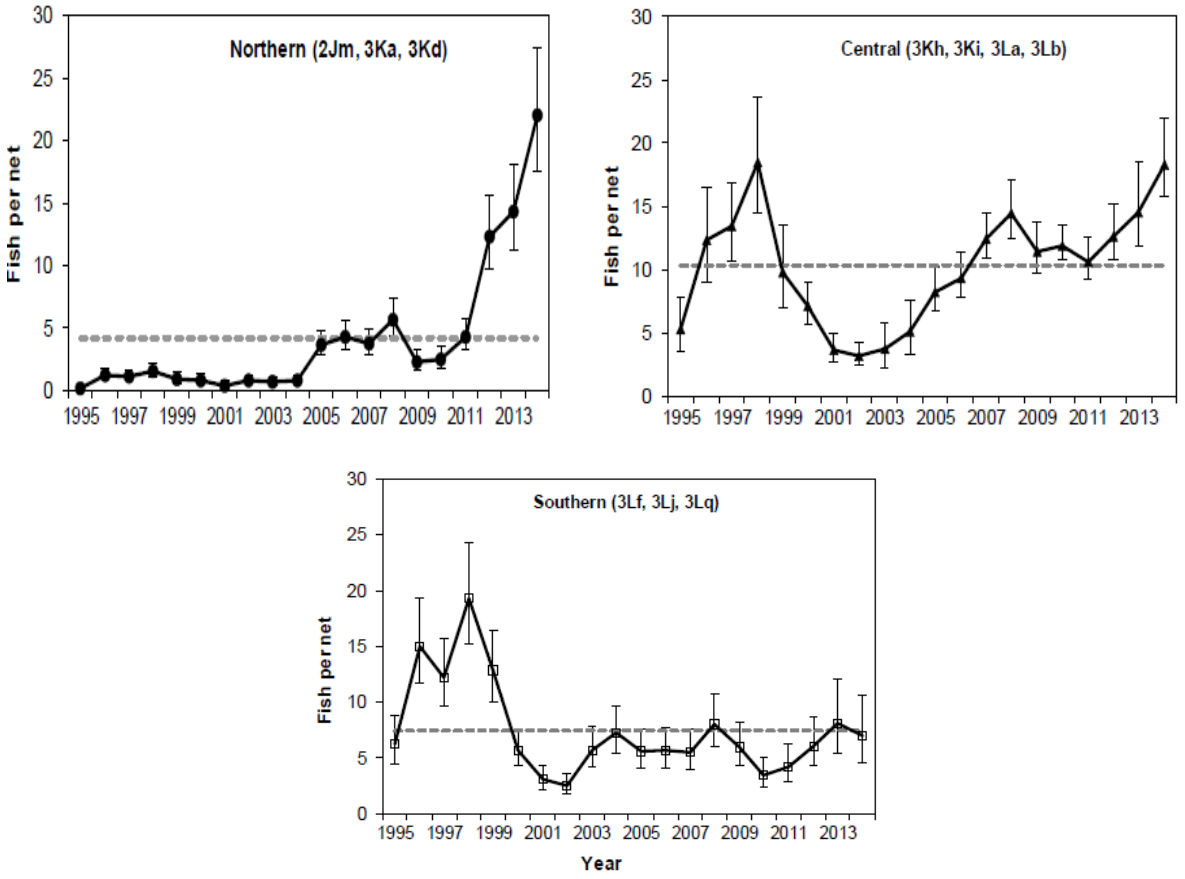


Figure 9. *Trends in gillnet (5½ inch mesh) standardized mean catch rate indices from sentinel surveys for each of the three inshore areas depicted in Fig. 3.5. Dashed lines indicate time-series average catch rates for each area.*

Indices from the autumn DFO survey and the Sentinel survey were generally higher in 2014, particularly in the north (Divs. 2J and 3K), indicating improvement in overall stock status.

Tagging. Information from recaptures of cod tagged in various inshore regions of 2J during 2013-14 and 3KL during 1997-2014 was used to estimate average annual exploitation (harvest) rates. No cod were tagged in the offshore during 2009-14, but most inshore tagging was conducted during July-October when migrant offshore cod would be inshore.

Tagging results indicate that exploitation levels continued to be low (≤ 5%) in 2014, for cod tagged in northern, central, and southern areas. These estimates incorporate assumed values for the annual rate of natural mortality (0.2 in 3L and 0.4 in 2J and 3K) and are based on tagged cod in the 50-85 cm length range at release; these cod would be well selected by commercial gears.

The reporting rate for tags (commercial and recreational combined) during 1997-2014 averaged 0.67; the value for 2014 was 57% which is the lowest in the time series. It is important that harvesters return all tags because low reporting rates can add uncertainty to the estimates of exploitation rates and the analyses of movement patterns and stock structure.

During 2014 recreational fishers returned more tags (54%) than commercial fishers (46%), after numbers were adjusted by respective tag reporting rates. The percentage of the total tags returned by recreational fishers has been high (average 39%, range 26% to 54%) during the past 7 years (2007-14). This indicates that recreational landings are substantial and that total removals are much higher than reported landings.

Abundance Indices – 2013 Stock Assessment (not included in the 2015 update)

Hydroacoustic survey of the Bonavista Corridor. An acoustic survey of the Bonavista Corridor extending over an area of approximately 13,000 km^2 was conducted by the Centre for Fisheries Ecosystems Research at Memorial University during May 2012 using the RV *Celtic Explorer*. Total abundance within the surveyed area was derived from acoustic data and length and age composition from two fishing sets conducted using a G.O.V. trawl. Total abundance was 61 million fish (38-93 million, 95 % CI) with an estimated spawning biomass of 131,000 t (82,000-199,000 t, 95 % CI). These are considered partial estimates because the survey had insufficient time to delineate the southern and northern extents of the aggregation.

Numbers at length and age in the spring acoustic survey were broadly similar to those found in the autumn DFO RV survey conducted in December 2012 in the same area. The acoustic survey targeted a spawning aggregation and reported fewer younger (i.e., < age 5) cod and more older (ages 8+) cod than the autumn DFO RV survey. The 2002 year-class at age 10 was strongly represented in samples of the spawning aggregation.

Commercial (Stewardship) Fishery. Catch and effort data for the <35 feet sector, from log-books for the 1998-2002 commercial fishery and the 2006-2012 stewardship fishery, were examined. Median gillnet catch rates (kg/net) dropped slightly during 2009 and/or 2010 but increased in 2011-2012 in each region. The trend in catch rates from log-books is broadly consistent with sentinel survey information. Commercial catch rates are expressed in terms of weight and recent increases are partly influenced by additional older (and therefore heavier) cod in the stewardship fishery catches in 2011 and 2012. Commercial fishers can also use larger mesh sizes (6.0 inch and 6.5 inch mesh) which select larger cod, whereas sentinel fishers are restricted to 5.5 inch mesh.

Beach seine surveys: Pre-recruitment. Information on the strength of recent year-classes is available from a beach seine survey in Newman Sound, Bonavista Bay (northern Div. 3L). This survey catches cod mainly of ages 0 and 1, with age 0 being much more strongly represented. These pre-recruit ages are not adequately represented in other indices. The information on age 1 from this study has been broadly consistent with the sentinel indices for the same year-classes (1995-2003) at older ages, but the correlation is less clear after 2003. Most of the year classes from 2003 onwards are weak at age 1, the exceptions being the 2007 and 2010 year classes which are above average. In addition, numbers of age 0 cod caught at several sites in Newman Sound during 2012 surveys were much higher than average and the second highest in the time-series. However, survival to age 1 can be highly variable; therefore, the strength of the 2012 year-class is currently uncertain.

Catch

See sections 2.4 and 3.2 above for information on catches.

Uncertainties (DFO 2010c, DFO 2013c, Harris 1990, DFO-NL, 2005)

The 2013 full assessment of 2J3KL cod (DFO 2013c) included the following regarding uncertainties in the latest full assessment for this stock:

> There are no direct estimates of recreational landings for 2009-2012. Estimates of removals from recreational fisheries in other years are uncertain. Without accurate estimates of recreational catch, total catch for northern cod remains unknown.
>
> The relative efficiency of the survey trawl at capturing different age groups is uncertain. If the catchabilities differ from the assumed values used in the cohort analysis, stock dynamics may differ from the results presented above.
>
> There is uncertainty in the assumed values for the rate of natural mortality used in estimating exploitation rates from tagging. Although a range of assumed values has been used in some analyses, if the rate of natural mortality changes over time and/or differs from the assumed value this will add uncertainty to the tagging estimates of exploitation rates.
>
> Lower reporting rates of tags add uncertainty to the estimates of exploitation rates from tagging and the analyses of movement patterns and stock structure.
>
> There is a high level of uncertainty surrounding the impact of predators on cod population dynamics.
>
> The estimate of spawning biomass from the acoustic survey in the Bonavista Corridor is based partly on sampling of lengths and weights from two fishing sets. Information from two tows is spatially limited and it is uncertain whether this sampling is representative of the size structure of the whole aggregation which extended over an area of approximately 13,000 km2. This may add uncertainty to the acoustic estimate of spawning biomass.

In fact there are no direct cod catch estimates from the recreational groundfish fishery during the period 2009-2015. It should be noted that the recreational groundfish fishery in 2J3KL is not the focus of this pre-assessment.

When examining the history of this fishery there have been several references to the potential distribution of fishing effort as well as the movement of cod between offshore and inshore areas that will provide important information to enable a more appropriate management of the fishery. While this is not a cause for concern with the low level of exploitation currently occurring, it will generate additional uncertainty as the SSB continues to grow beyond the LRP, accompanied with associated increases in fishing mortality. Some of these references include:

In the Independent Review of the state of the Northern Cod, Harris (1990) included these recommendations:

> *That DFO must establish regulations to limit fishing mortalities imposed during the spawning*

period proportionally with the general reduction in total fishing mortality and should explore with the affected sectors of the fishing industry whether this objective can be best achieved through a straight reduction in the winter catch (Le. during the spawning period) or through a combination of seasonal closure coupled with a catch reduction proportional to the reduction of the TAC during the remainder of the spawning period.

That DFO should re-examine current regulations requiring equal levels of effort in each of statistical divisions 2J, 3K and3L with the objective of distributing fishing effort by large trawlers throughout the statistical divisions in the manner that is to the greatest degree possible relative to the distribution of the exploitable biomass.

That DFO should expand scientific efforts to understand the integrity and interrelationship of spawning aggregations as they relate to recruitment and the distribution of spawning fish to feeding grounds and their availability to inshore fisheries. The goal should be to attain a clearer understanding of the effectiveness of current area management strategies as they relate to rebuilding spawning stocks and potential gear/area or other allocation goals.

Further, in 2005 the Canada-NL Action Team (DFO/NL 2005) was mandated to identify and evaluate science priorities and information with respect to the management of cod stocks. A commentary on potential cod research priorities was provided which, in the opinion of the Action Team, provided the strongest linkage to the various recovery strategies that have been identified in their report. One of these priorities was:

"*Additional research to study the migration patterns of cod within the inshore and between the inshore and offshore. A better understanding of cod distribution, behavior and population dynamics is vital to determining the impact of an inshore fishery on the recovery of cod in the offshore."*

The 2010 2J3KL cod stock status report (DFO, 2010c) included the following:

"*Some aspects of current stock structure require further study. Catch rates increased in sentinel surveys in 2J and northern 3K in 2005, but the origin of the fish that generated these higher catch rates is uncertain. The extent of migration between the inshore and offshore of 2J3KL during recent years is not well understood, but new tagging results indicate that the historical shoreward seasonal migration pattern of the pre-moratorium period did occur during 2008 and 2009. The offshore biomass of cod in 2J3KL is low but increased during 2003-2008; the contribution of offshore cod to the inshore biomass during summer may have increased during this period."*

Given the above, it is clear that cod migration patterns as well as gear/area impacts of the fishery on various stock components, included the spawning stock, need to be better understood. Monitoring of this will be important as the stock continues to rebuild and fishing effort begins in increase and expand over space and time.

In addition to the repeated concerns related to the lack of estimates for the recreational catch, the 2010 full assessment of Cod in 2J3KL (DFO 2010c) included the following regarding the catch estimates from the stewardship fishery:

Estimates of stewardship fishery catch are also uncertain. At stock assessment meetings and consultations commercial fishers often report that stewardship landings and recreational

removals are underestimated. If the level is substantial, then there is more uncertainty in catch-based assessments and in the evaluation of the impact of future removals.

This concern was repeated in the 2011 assessment (DFO 2011), however it was not raised in the 2012 (DFO 2012b), 2014 (DFO 2014a) or 2015 (DFO 2015d) stock assessment updates nor was it raised in the 2013 full assessment of the 2J3KL cod stock (DFO 2013c). While this issue has not been raised in the past 4 years, if it is still a cause of uncertainty steps should be taken to ensure the most accurate determination of cod catch from the stewardship fishery.

Conclusions by the Assessment Committee related to the 2015 update for 2J3KL cod (DFO 2015d)

- Indices from the autumn DFO RV survey and the Sentinel survey were generally higher in 2014, particularly in the north (Divs. 2J and 3K), indicating improvement in overall stock status.
- Recent recruitment has improved, but is not expected to result in major changes to SSB relative to the LRP in 2015.
- Tagging results indicated that exploitation levels continued to be low (≤ 5%) in 2014.
- The SSB from the autumn DFO RV survey increased from 19% of the LRP in 2011-13 to 26% in 2012-14 and, although improving, remains in the critical zone.
- To be in accordance with the DFO Precautionary Approach framework, management actions must promote stock growth, and removals from all sources must be kept to the lowest possible level until the stock has cleared the critical zone.

Long-term Outlook

The environment is always changing. The recent long-term warming trend in the climate system is driven by an increase in temperature associated with both climate change and the warm phase of the Atlantic Multi-decadal Oscillation (AMO). A suite of associated changes (e.g. slowing down of the Labrador Current, reduction in ice coverage, more frequent extreme weather events) can have important effects on the ecology of the marine ecosystem (e.g. timing of blooms) which impact all trophic levels (DFO 2014b).

Under productivity conditions observed during 2010-2012 (fishing mortality, natural mortality, and recruitment) the average SSB has been projected to remain stable, well below the LRP. No projections are available using 2013 survey results, but preliminary indications suggest improved survival and more abundant pre-recruits (ages 1 and 2). If these conditions persist, then SSB could improve in 4-5 years (2018-2019), but is expected to remain below the LRP. To reach the LRP by 2019, the stock would have to increase by 50% every year over 2015-2018.

Reference Points

A variety of analyses conducted in November 2010 led to the establishment of a Limit Reference Point (LRP) for cod in NAFO Divisions 2J3KL (DFO, 2010b). It was concluded at that time: *The 2J+3KL cod spawner biomass and recruitment remain at extremely low levels compared to the 1960's. SSBs in the 1980's were the last to produce medium levels of recruitment. After the 1980's SSB has been low and recruitment poor, indicating that the stock has been below a level where serious harm occurs. The average SSB during the 1980's is considered as the limit reference point for 2J+3KL cod. The stock is currently estimated to be at 10% of this LRP. The model spawning stock during the 1980s' was 55 Kg per tow or 660 000 t. Recent estimates of total mortality have been lower than the very high levels experienced by 2J+3KL cod from 1996 to 2003, thus establishing a LRP based on the low productivity period is not appropriate for this stock. This LRP should be re-evaluated once more data, particularly at higher stock sizes, are available.*

While a Biomass limit reference point was established, the process in 2010 did not provide for any other reference points. Upper Stock Reference (USR) points, target biomass or fishing mortality reference points, etc. are currently not defined. However there is a cod rebuilding process in place, comprised of DFO and industry scientists as well as academia, industry participants and representatives from the Province of Newfoundland and Labrador. This process is examining many issues related to reference points and decision rules for 2J3KL cod.

Estimated SSB has been well below the LRP since the early 1990s. Although the stock has shown some growth, an expansion of age structure, and improved catch rates especially in the north, the estimate of 2012 SSB is 15 % of the LRP. The 2011-2013 average SSB is 19% of the SSB, while the 2012-2014 average is 26%. At current levels of SSB the stock is considered to have suffered serious harm and the ability to produce good recruitment remains seriously impaired. When the stock is at such a low level management actions should focus on promoting further increases in SSB and subsequent recruitment until the stock is more resilient to the effects of fishing.

Harvest Strategy and Harvest Control Rules

The overall harvest strategy currently in place for this stock is determined through the policies outlined in the Canadian Sustainable Fisheries Framework (SFF) and are included in the 2013 Groundfish IFMP. There is a single generally understood harvest control rule: to keep the removals of cod at the lowest possible level. There are no biomass based decision rules at this point. In the meantime, as the stock is currently well below Blim there is time to have a full precautionary approach framework developed, including a complete suite of reference points as well as explicit harvest control rules.

3.4 Principle Two: Ecosystem background

Physical Environment

NAFO Divisions 2J3KL are off the Canadian Atlantic coast. Division 2J is located off the south coast of Labrador and makes up part of the Labrador Sea. Division 3K is off the North East coast of the Island of Newfoundland while Division 3L is off the east coast of Newfoundland and is often described as the Northern Grand Bank. A full description of the location of these areas is found in the NAFO Convention (http://www.nafo.int/about/frames/area.html)

The Area from land to 1000 m in Divisions 2J and 3K are fully inside Canada's EEZ. This is not the case in Division 3L, with a substantial portion of the area being outside Canada's 200-mile limit. This area is generally managed by NAFO.

Ecosystem Background

During the late 1980s and early 1990s the fish community in the Newfoundland and Labrador large marine ecosystem collapsed. This collapse was more dramatic in the northern regions and involved commercial and non-commercial species, including Capelin, the keystone forage fish in this ecosystem. It was also during this period that important increases in shellfish species (e.g., Northern Shrimp, *Pandalus borealis*) took place.

During 2003 to 2007 there was an increasing trend in the fish biomass in Div. 2J3KL; some components of the fish community (e.g., piscivores such as Atlantic Cod, Greenland Halibut *Reinhardtius hippoglossoides*, and Atlantic Halibut *Hippoglossus hippoglossus*) and large benthivores (e.g., American Plaice *Hippoglossoides platessoides*) showed some positive signals (DFO 2013c, DFO 2014b). These were the first significant changes observed in the fish component of ecosystem structure since the collapse, and coincided with an improvement in Capelin biomass during this period. The most recent (2011) ecosystem information indicates that the overall biomass level of the fish community has shown a modest increase from the level reached in 2007-2008, but this overall increase is essentially driven by planktivores-piscivores (e.g., redfish *Sebastes* spp.), while other fish functional groups remain at the levels attained by 2008. Overall, despite the increases observed in the biomass of the fish community since the low point reached in the 1990s, the fish community still remains at a significantly lower level in comparison to the pre-collapse period.

Physical Oceanography

The marine environment off Labrador and eastern Newfoundland experienced considerable variability since the start of standardized measurements in the mid-1940s. A general warming phase reached its maximum by the mid-1960s. Beginning in the early 1970s there was a general downward trend in ocean temperatures, with particularly cold periods in the early 1970s, early to mid-1980s and early 1990s. Ocean temperatures have been above normal for the past decade, reaching highs in 2006, declining to more normal values in 2007-2009, then increasing to record highs in 2011, before decreasing slightly but remaining above normal in 2012. Salinities in 2009-2012 have been fresher than normal. The area of the cold intermediate layer (CIL) on the Newfoundland shelf was at a record low in 2011 but expanded slightly in 2012 (DFO 2013c).

The impact of these oceanographic changes on cod population dynamics is difficult to determine. Cod in this area can be more productive when water temperatures are toward the warm end of the regional norm. Cod somatic growth values were among the highest in the time series in Div. 3KL when temperatures were approaching the peak of 2011-2012. Cod recruitment rate (R/SSB) also shows a weak but positive correlation with a composite climate index derived from a suite of meteorological, ice and ocean temperature and salinity time series.

Ocean Productivity

Bi-monthly ocean colour imagery and oceanographic data indicate a decline in standing stocks of marine phytoplankton (primary producers) across the Newfoundland and Labrador Shelves in 2012. Timing indices of the spring bloom suggest a trend toward earlier and shorter production cycles.

Indices of primary and secondary production from seasonal oceanographic surveys have remained relatively stable over the past decade and in some cases have trended upwards (e.g., copepod abundance). As a result, these increasing trends in primary and secondary production may have supported feeding of early life stages of northern cod. Preliminary analysis indicated a weak positive association between the *Calanus finmarchicus* abundance anomaly and the cod recruitment rate (R/SSB) and this relationship requires further exploration. Long-term changes in primary and secondary producers based on the Continuous Plankton Recorder indicate increased standing stocks of phytoplankton and zooplankton during the 2000s and recent years, although certain cold-water-adapted calanoids (*Calanus hyperboreus*) and macro-zooplankton such as euphausiids have declined on the southern and northern Newfoundland Shelf (DFO 2014b).

Primary Species Outcome

Under Version 2.0 of MSC Standard, Primary species are considered to be the 'Managed, in-scope' (e.g., fish and shellfish) species. Primary species will usually be species of commercial value to either the UoA or fisheries outside the UoA, with management tools controlling exploitation as well as known reference points in place. In accordance with MSC 2.0, main primary species are defined as those that constitute over 5% of the total catch but there are cases that could be less than 5% when these specific species are considered vulnerable. Evaluation of the impact of unwanted catch (discards) and post-capture mortality in main primary species are also evaluated.

Given that current and actual specific information was not obtained from DFO on landings of non-target species and unwanted catch by gear for all units of assessments, the assessment team decided to use data from Aldous (2011) (Table 3.3) to evaluate composition of main and minor primary species.

Table 3.3. Catch and Discards in the Northern Cod Stewardship Fishery 2010 (DFO Logbook Data) From Aldous (2011)

Species	Data (Kg)	Cod Pots	Gill Net	Hand Line	Longline	Pot	Trap	Grand Total
American plaice	Catch		642					642
	Discards		0					0
Cod, Atlantic	Catch	12,117	1,823,654	619,608	37,044		12,590	2,505,013
	Discards	0	218	74	0		0	292
Crab, spider/toad	Catch					715		715
	Discards					0		0
Grenadier, rough-head	Catch		0					0
	Discards		318					318
Hake, white	Catch		4					4
	Discards		0					0
Herring, Atlantic	Catch		125					125
	Discards		0					0
Mackerel	Catch		210	136				346
	Discards		0	0				0
Redfish	Catch		10	33				43
	Discards		0	0				0
Sculpin	Catch		462					462
	Discards		0					0
Turbot/Greenland halibut	Catch		1,079					1,079
	Discards		0					0
Winter flounder	Catch		125					125
	Discards		0					0
Wolffish, Striped/ Atlantic	Catch		5					5
	Discards		0					0
Total Sum of Catch RW Kgm		12,117	1,826,316	619,777	37,044	715	12,590	2,508,559
Total Sum of Discards Kgm		0	536	74	0	0	0	610

With the low number of fishers/buyers/vessels involved in the stewardship fishery for 2J3KL cod DFO was unable to provide detailed by-catch information for the most recent period. A short description of these confidentiality concerns was presented in Section 3.2 (Overview of the Fishery). In the meantime, DFO did provide by-catch information in a more general way. A full list of by-catch species was provided for all gear types for the period 2011-2014 (Table 3.3a).

Table 3.3a. General description of by-catch in the 2J3KL cod stewardship fishery. Species denoted with "x" were taken as by-catch. No species exceeded 5% of the total catch or the total cod catch.

Longline	2011	2012	2013	2014
American plaice		x		

Handline	2011	2012	2013	2014
Redfish	x			
Shark (unspecified)	x			

Table 3.3a. Continued.

Gillnets	2011	2012	2013	2014
Am Plaice	x	x	x	x
Cod (Rock)				x
Crab (spider/toad)			x	
Greysole	x			x
Haddock	x			
Hake (white)				x
Halibut		x	x	
Herring	x			
pollock	x	x		
Redfish	x	x	x	x
Sculpin	x	x	x	x
Skate	x			
Greenland Halibut	x	x	x	x
Winter flounder	x	x	x	x
Yellowtail flounder				x

The cod pot and cod trap fishery had limited activity and cod catches were very low (Section 3.2 above) and there were no by-catches recorded.

While the information above lacks specific detail it is quite consistent with the by-catch information included in Table 3.3 (Aldous, 2011). Given this consistency the assessment team concluded that using the 2010 detailed data above was an appropriate proxy for the determination of primary and secondary species for this pre-assessment.

Species Composition of the gillnet fishery in 2J3KL (UoA 1)

There were no primary main and minor species

Species Composition of the longline fishery in 2J3KL (UoA2)

There were no primary main and minor species

Species Composition of the hand line fishery in 2J3KL (UoA 3)

There were no primary main and minor species

Evaluation of Utilization of Bait as Primary Species

There has been insufficient data provided to determine the status of some of the bait species on the longline and handline fishery (i.e. Herring, Mackerel) that are used for the 2J3KL cod stewardship fishery. No information is available on how these species used as bait are managed. Depending on their stock status, a partial strategy might be needed.

Primary Species: Management Strategy

According to MSC 2.0 Since there is no main and minor primary species, there is no need for a management strategy.

There were no primary main and minor species.

Primary Species Information/ Monitoring

Fishery Independent Data
Annual abundance estimates of all managed species are provided by DFO Survey Cruises. Important biological data (length frequencies, age/growth, reproduction, food habits, etc.) are derived from material collected during the DFO survey cruises.

Fishery Dependent Data
Catch and discard data in the fishery are collected on board by fisheries observers. Landings and effort data are recorded by DFO, based on port sampling and vessel logbooks. All groundfish caught, with the exception of those mentioned in 2015 Groundfish General Conditions and those species listed under the *Species at Risk Act* (Northern and Spotted wolfish), must be landed.

Secondary Species Outcome
Secondary species include fish and shellfish species that are not managed according to reference points and birds/mammals/reptiles/amphibians (all species that are out of scope of the standard) that are not ETP species. These types of species could, in some cases, be landed intentionally to be used either as bait, as food for the crew or for other subsistence uses, but may also, in some cases, represent incidental catches that are undesired but somewhat unavoidable in the fishery. Given the often unmanaged status of these species, there are unlikely to be reference points for biomass or fishing mortality in place, as well as a general lack of data availability.

Species Composition of the Gillnet Fishery in 2J3KL (UoA1)

There were no secondary main and minor species

Species Composition of the Longline Fishery in 2J3KL (UoA2)

There were no secondary main and minor species

Species Composition of the Hand line Fishery in 2J3KL (UoA3)

There were no secondary main and minor species

Secondary Species: Management Strategy

According to MSC 2.0 Since there is no main and minor secondary species, there is no need for a management strategy.

Secondary Species: Information/ Monitoring

Please see Primary Species Information/Monitoring Section

Endangered, Threatened, or Protected (ETP) Species

Three ETP species are known to occur in the 2J3KL area. Two of these three species are wolffishes (Northern and Spotted). The third species is Leatherback turtle.

Wolfishes and Fishery Effects on Outcome Status

Three species of wolffish are considered ETP species: Atlantic (*Anarhichas lupis*), Northern (*A. denticulatus*) and Spotted (*A. minor*). Northern and Spotted wolffish are considered *threatened* under SARA Schedule 1 and Atlantic wolffish is a *species of special concern*. Reports of live release are between 74% and 96% based on the SARA logbook queries. A wolffish release program was undertaken to determine the post release survivability of wolffish in commercial fisheries. If wolffish are returned to the water with minimal handling, survivability is reportedly high (Grant et al, 2005).

In the wolffish recovery and management plan (Kulka et al 2007), the level of take as bycatch as well as habitat destruction by trawl gear was cited as potential risk factors. An allowable harm assessment was conducted and determined whether, since the cessation of a directed fishery, the current level of bycatch from other fisheries was hindering recovery. Fishing was not found to be hindering recovery as populations were either stable or increasing (Kulka et al, 2007).

Wolffish Management Measures and Strategies

A recovery and management plan was developed for all three SARA listed wolffishes (Kulka et al, 2007). The objectives of the recovery strategy include:

1. Increasing knowledge of biology and life history;
2. Conserving and protecting habitat;
3. Mitigating human impacts;
4. Promoting population growth and recovery; and
5. Education.

Wolffish are encountered as bycatch, but must be returned to the water in a way that induces the least amount of harm (minimal handling, not disturbing the gills, etc).

Wolffish Information and Monitoring

Wolffish indices of abundance are available from demersal longline surveys and multi-species DFO trawl surveys. These data also provide enough information to detect any changes in the spatial extent of their ranges. Biological samples and life history traits are recorded in the surveys to detect any changes in growth rates or age/sex structure. All interactions with fishing gear must be recorded on SARA logbooks and are entered into a queriable database. Additional information on bycatch rates are available from on-board observed trips. Conditions attached to licences for fishers who participate in the 2J3KL cod stewardship fishery include provisions for the live release of Northern and spotted wolffish.

Leatherback Sea Turtle (*Dermochelys coriacea*) and Fishery Effects on Outcome Status

Leatherback sea turtles are most often encountered in pelagic or near surface long line gear. Longline fishers are currently using circle hooks to lower the occurrence of turtle hooking, increase survivability and assist in the ease of hook removal (COSEWIC 2012). It has been documented that Leatherback sea turtles undertake deep dives, so there is potential for demersal gear contact (Doyle et al, 2008). The assessment team was provided with SARA log book registry query information for Scotia-Fundy and Newfoundland for demersal mobile and fixed gear types. No positive query results were returned (2007-2011) for leatherback sea turtles.

Leatherback Sea Turtle Management Measures and Strategies

The leatherback sea turtle recovery strategy was implemented in 2006 and includes goals and strategies to protect and recover the species (ALTRT 2006). The goal for the recovery strategy is to "increase the population such that long-term viability of the turtles frequenting Atlantic Canadian waters in achieved." Six recovery objectives were identified. These are:

1. Understanding Threats. Identify and understand anthropogenic threats to turtles in Atlantic Canadian waters;
2. Understanding Turtle Life History Characteristics. Support research and monitoring that will fill knowledge gaps concerning general organismal traits of leatherback turtles in Atlantic Canadian waters;
3. Habitat Identification and Protection. Identify and protect habitat of turtles in Atlantic Canadian waters;
4. Risk Reduction. Minimize risk of harm to turtles from anthropogenic activities under Canadian jurisdiction;
5. Education. Develop and implement education activities that support turtle recovery in Canada; and
6. International Initiatives. Promote international initiatives contributing to the recovery of turtles.

To achieve these objectives, the Nova Scotia Leatherback Turtle Working Group (NSLTWG) has initiated several of the strategies. The NSLTWG is a joint group that includes scientists, volunteers and fishing industry representatives. Many of the initiatives, from changing over to circle hooks, public education, additional observer information requirements (gear configuration) have come from the Government of Canada's Habitat Stewardship Program (ALTRT 2006).

All non-groundfish are required to be returned to the water in a manner that facilitates the least amount of harm as a condition of licence. Rescue groups are dispatched whenever a gear interaction is reported. In the Maritimes Region, basic training is provided to DFO officers and volunteer fishermen. Most fishers employ circle hooks which have been found to hook turtles less frequently (Mug et al, 2008).

Leatherback Sea Turtle Information and Monitoring

The NSLTW and the Canadian Sea Turtle Network (CSTN) are two entities dedicated to document leatherback and loggerhead sea turtle sightings by means of information from fish harvesters. All vessel operators are required to fill out and turn in SARA Registry logbooks to identify any interaction with fishing gear. Records from logs and on-board observers were used to estimate the total number of leatherback sea turtle interactions. Leatherback fishing gear interaction survivability studies in the US were also evaluated (Dwyer et al, 2003). Results show that fisheries activities were not jeopardizing survival or recovery. The issue was addressed again during public review in March 2012 to develop terms of reference and action items.

In an effort to mitigate potential threats posed by commercial fishing gear, a marine animal disentanglement and stranding program was established in Newfoundland through funding provided under the Government of Canada's Habitat Stewardship Program. It was established to mitigate impacts of inshore fisheries on leatherback turtles as well as to promote sea turtle conservation through outreach and education.

Habitat

Legislative and Policy Framework

On June 29, 2013 amendments to the *Fisheries Act* were approved. The newly-created Fisheries Protection Program (FPP) and its Policy Statements (November 2013) support changes made to the *Fisheries Act*. The mandate of the Fisheries Protection Program is to maintain the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries. The Fisheries Protection Policy Statement (FPPS) focuses on the management of impacts to fish resulting from habitat degradation or loss and alterations to fish passage and flow.

Through the FPPS, DFO objectives are to provide consistent guidance through regulations, standards and directives, and to make regulatory decisions in a timely manner. In this way, proponents will have the necessary information and direction to avoid, mitigate and offset harmful impacts to fish and fish habitat so that they will meet the goal of this policy, and thereby comply with the fisheries protection provisions of the Fisheries Act. The prohibition against serious harm to fish applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the *Fisheries Act* prohibits serious harm to fish which is defined in the Act as "the death of fish or any permanent alteration to, or destruction of, fish habitat."

Proponents are responsible for avoiding and mitigating serious harm to fish that are part of or support commercial, recreational or Aboriginal fisheries. When proponents are unable to completely avoid or mitigate serious harm to fish, their projects will normally require authorization under Subsection 35(2) of the *Fisheries Act* in order for the project to proceed without contravening the Act.

The Subsection 35(1) prohibition will be applied to those projects that have the potential to cause serious harm to fish. These projects are likely to reduce the ability of the fish habitat to directly or indirectly support the life processes of fish or result in the death of fish. Relationships between typical project impacts (e.g., temperature change, sedimentation, infilling, reduction of nutrients and food supply, etc.) and the consequences to fish or fish habitat are described in various Pathways of Effects diagrams.

Projects requiring authorization are those likely to result in a localized effect to fish populations or fish habitat in the vicinity of the project. Localized effects may also lead to more widespread impacts on fish and fish habitat and, in turn, affect the ability of the area to produce fish. DFO interprets serious harm to fish as:

- The death of fish;
- A permanent alteration to fish habitat of a spatial scale, duration or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes;
- The destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes.

In 2009, DFO published the Policy for Managing the Impact of Fishing on Sensitive Benthic Areas under the auspices of the Sustainable Fisheries Framework in response to the 2006 United Nations Resolution 61/105 . The purpose of the policy is to help DFO manage fisheries to mitigate impacts of

fishing on sensitive benthic habitats or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species. This national policy applies to all commercial, recreational and Aboriginal fishing activities licenced and/or managed pursuant to the *Fisheries Act* and the *Coastal Fisheries Protection Act*, including fishing inside and outside of Canada's EEZ.

A key tool for use in the implementation of the policy is the Ecological Risk Assessment Framework which outlines a process for identifying the level of ecological risk of fishing activity and its impacts as sensitive benthic areas in the marine environment. DFO has developed this framework specifically for use in managing cold-water corals and sponge-dominated communities. Both are currently the focus of international efforts to reduce the impacts of fishing on benthic environments (e.g. Food and Agriculture Organization International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, Northwest Atlantic Fisheries Organization Vulnerable Marine Ecosystem impact assessments), and hence they are among the most well understood from a management perspective.

DFO's Ecological Risk Assessment Framework outlines a process whereby the ecological risk of fishing impacts is determined through the examination of two factors:

1. Consequence, which examines the anticipated degree of impact on a sensitive benthic area resulting from an overlap between it and the fishing gear; and
2. Likelihood, which examines the probability that the fishing gear will overlap with sensitive benthic areas.

The development of management options are guided by the ecological risk level. Where the fishing activity presents a low risk to the benthic habitat, no additional management options are generally required. Where risk levels are determined to be moderate, additional management options may be required based on the specific circumstances of the fishery and benthic habitat being investigated. Examples may include changes to the fishing methods. Where the risk has been determined to be high, additional management options will usually be required. Examples include fisheries closures or gear modifications and/or restrictions. Options would be determined on a case-by-case basis, in consultation with stakeholders and Aboriginal groups, using existing processes that would be adapted to the specific circumstances.

Gear/Habitat Interactions

It is well known that mobile bottom-contact fishing gears such as otter trawls do have impacts on benthic populations, communities, and habitats. Collie *et al* (2000) found that fauna in stable gravel, mud and biogenic habitats are more adversely affected than those in less consolidated coarse sediments. Studies at three sites in the Gulf of Maine (off Swans Island, Jeffreys Bank, and Stellwagen Bank) showed that mobile fishing gear altered the physical structure (complexity) of benthic habitats (Auster *et al*, 1996 & 1999). Complexity was reduced by direct removal of biogenic (e.g., sponges, hydrozoans, bryozoans, amphipod tubes, holothurians, shell aggregates) and sedimentary (e.g., sand waves, depressions) structures.

The recovery of marine habitats has also been extensively studied. Lindholm *et al* (2004) compared the habitat status of fishery-closed areas and fished areas on Georges Bank. They compared the relative abundance of seven common and two rare microhabitat types. There were only significant differences noticed on 2 of the 9 (shell fragment and sponge) microhabitat types. It was concluded that the lack of significant differences in the relative abundance of most of the common microhabitat resources inside and outside of the closed area may be interpreted as a consequence of the level of

fishing effort matching the ability of the ecosystem to accommodate human-caused disturbances over short time periods.

Studies on impact of Gillnets in Habitats

There have been no studies that have specifically considered the impacts of the stewardship gillnet fishery on benthic habitats in Newfoundland/Labrador (DFO, Pers. Comm.). The existing information on habitat features is available at a coarser scale and the impacts of the fishery are only known generally. In 2010 DFO Science held a national advisory process to examine more generally the habitat and ecosystem impacts of gillnets and other fishing gears (excluding mobile bottom-contacting gears). That process provided general advice on the potential impacts of gillnets, noting how the context of use might affect the impacts:

- The nature of the impact (i.e. what is impacted and in what way)
- The location and scale of the fishery (overall and relative to the location and scale of the ecosystem feature being impacted)
- How the gear is rigged, deployed, and retrieved
- Any additional threats facing the ecosystem feature being impacted by the gear in question.

Dufour and Ouellet (2007) and DFO (2010a) provide a comprehensive analysis of the potential impacts of non-trawl fishing gear in Canada, including pelagic and bottom gillnet which is used to fish herring and groundfish as in the Labrador/Newfoundland. There are three parts of gillnet gear that can interact with benthic habitats: i) the weights or anchors, ii) the leaded rope or footgear, and iii) the net itself. The weights can destroy benthic fauna or re-suspend sediments through retrieving the gillnet; the leaded rope may have some impact on bottom substrates during retrieval or when the gillnet is moved; and, the mesh could become entangled on bottom habitats with high vertical structure and when the net is retrieved it can cause damage.

The area in which the gear is deployed can exacerbate the impacts of the gear, for example, if the gear its set in areas with high current, poor weather, high vertical heterogeneity or high species diversity. The breaking strength of the lines, ropes and net can also affect the relative impact of the gear on habitats (Fuller et. al. 2008, Shester and Micheli 2011). Ropes of greater strength increase the likelihood of damaging entangled biogenic habitat, while weak lines or web increase the possibility of loss leading to entanglement and fouling. This is more common for demersal gillnets; mid-water and surface gillnets interact little with benthic habitats except when the gear is lost. Furthermore there could be other problems such as diminished availability of water column habitat to pelagic species or species groups (e.g. marine mammals) if an area becomes unusable or undesirable due to the presence of gillnets.

Finally, the assessment team considered that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

There has been some documentation of effects of longline activities with habitats in the Northwest Atlantic (Grabowski et al 2014). It has been shown that the terminal anchors of bottom-set longlines interact with the bottom habitat. Otherwise this gear has little or momentary contact with that bottom habitat and as such has little physical impact during controlled fishing. Hooks and complete snoods (i.e. branch lines) may, however, be lost or deliberately discarded, especially when gear is damaged or tangled during fishing.

The low levels of effort involved, combined with the minimal impact on the benthic and pelagic environments, means that hand lines have negligible impacts on the marine habitats.

Major Habitats

Coarse data on surficial geology are available from the Newfoundland and Labrador Seabed Atlas (http://www.seabed-atlas-nl.ca/). These data suggest that the majority of the deeper 2J3KL offshore area is made up of softer sediments including clay/silt and sand, with significant areas of glacial till. Mixed sand/gravel appears to predominate in the southern area of 3L and central 2J (Aldous 2011).

The area 2J3KL is part of the Newfoundland and Labrador Shelf Ecozone (NLSE) that extends from the northern tip of Labrador south to the Grand Banks, and which is bounded by the Canadian Exclusive Economic Zone. The total area of the NLSE is greater than 2.5 million km2 and exhibits significant variation in seabed structure and habitat that is represented by extensive coastal forms, offshore banks, slopes, and canyons. In combination with influences mainly from the southerly-flowing Labrador Current, but in unison with other drivers, the waters off Newfoundland and Labrador are some of the most productive in the world. Given its temperate nature the NLSE supports an impressive diversity of marine life, including various species of cold-water corals, plankton, fish, mammals, amphibians, and seabirds (DFO 2010a)

VME - Deep Sea Corals

Deep sea corals are typically found at depths greater than 50 meters on the continental shelf and slopes, in offshore canyons, and near seamounts. Many of these species form complex three dimensional structures that provide important habitat for many species of fish and invertebrates, enhancing local biodiversity. Because these corals are fragile and slow-growing, they are particularly vulnerable to disturbance from certain types of fishing gear.

While the extent of deep sea coral habitat degradation has not been quantified in most areas, bottom tending fishing gear has been known to cause significant disturbance in many locations, and is considered to be the major threat to deep sea corals in areas where such fishing occurs.

Effects of commercial fishing gear on deepsea corals has been documented. Passive gear, such as pots or longlines, can affect localized area of corals. Coral mortality is markedly increased due to corals being crushed, buried and wounded by gear as it is dragged over the bottom (Fosså et al 2002). The degree of disturbance to the coral and seafloor ranges from lightly disturbed areas of overturned cobble with attached living coral, to complete stripping of the seafloor (Stone 2006).

There has been different sets of measures to protect deep sea corals from fishing activities. For example: Designation of coral protection zones based on the discretionary authority. These zones could include but are not limited to:

- Large precautionary areas based on a freeze-the-footprint approach
- Enhanced protections in areas known to or expected to contain high concentrations of corals

The gear types involved in the 2J3KL cod fishery have generally low impact on the benthic ecology and although there may be local effects where fishing density is greatest, the area fish is quite small compared to the large scale of the region.

Marine Protected Areas

Fisheries and Oceans Canada contributes to the Network through the establishment of MPAs under the *Oceans Act*. DFO also focuses on areas of interest that are at various stages of progress towards designation. These areas are ecologically significant, with species and/or properties that require special consideration (http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm).

Establishing marine protected areas (MPAs) within the context of integrated oceans management provides a mechanism for taking into account stakeholder input as well as broader ecological, social, cultural and economic considerations. It also provides an opportunity to reinforce conservation measures with complementary management regimes implemented in surrounding areas, including linkages with broader ecosystem objectives, as well as land-based initiatives such as habitat protection and enhancement, pollution control, land use controls and the establishment of coastal terrestrial parks. This approach of nesting MPAs within broader planning initiatives helps maintain the integrity and long-term viability of the MPA and maximize the conservation effectiveness of all MPA planning processes.

There are two Marine Protected Areas within NAFO Divisions 2J3KL. While Atlantic cod are not the focus in these areas, the fishing for cod is prohibited in these areas during the Stewardship fishery or sentinel survey.

Gilbert Bay MPA (http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/factsheets-feuillets/gilbertbay-baiegilbert-eng.htm)

Gilbert Bay is 60 km^2 in size and is located approximately 300 km from Happy Valley-Goose Bay on Labrador's southeast coast. The bay is 20 km in length but less than 100 m deep with two narrow outlets to the sea, one at Williams Harbour Run and the other at Winard Tickle. This geophysical configuration contributes to the bay's unique character through semi-isolation from the Labrador Sea.

The waters of Gilbert Bay support a wide range of marine resources including several species of shellfish (mussels, scallops, sea urchins, snails, shrimp), cod, pelagic fishes (herring, capelin, salmon, eels, smelt, trout) and aquatic plants (eel grass, kelp). The area is also inhabited by several species of waterfowl including black ducks, geese and mergansers.

Since 1996, scientists from Memorial University of Newfoundland have conducted research in Gilbert Bay and have found the habitat supports a resident population of Atlantic cod. Through careful scientific analysis it has been determined that the "reddish-brown" cod are genetically distinct from other Labrador cod. Tagging and tracking of the cod has confirmed that the species remain in the bay year round.

Since this discovery, people from the local communities, scientists, and the Provincial Government have approached Fisheries and Oceans Canada to put measures in place to protect the unique ecosystem, including the various commercial and non-commercial fish species. On the basis of this support and existing information, Fisheries and Oceans Canada has selected Gilbert Bay as an Area of Interest (AOI) in the Marine Protected Area (MPA) program under the *Oceans Act*.

In October 2005, the Minister of Fisheries and Oceans Canada announced the designation of the Gilbert Bay Marine Protected Area.

Eastport MPA (http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/eastport-eng.htm)

The Eastport Peninsula, one of the most picturesque areas of Bonavista Bay, is located approximately three hour drive from St. John's, Newfoundland. The rugged coastline is interrupted by a number of headlands, coves, and beaches. Numerous islands found in the area provide habitat for a variety of marine wildlife. The rich, productive waters surrounding the Eastport Peninsula are host to a wide range of groundfish, pelagic fish, shellfish, marine mammals, and aquatic plants. Since early settlement the people of the Eastport Peninsula have relied on the fishery for their economic subsistence.

In 1995, to address declining catches, the Eastport Peninsula lobster fish harvesters formed the Eastport Peninsula Lobster Protection Committee (EPLPC). The aim of the Committee was to implement an overall lobster conservation strategy for the Eastport Peninsula. Committee members provided information and data required for the management of the resource and implemented various measures to address conservation and sustainability. Based on the initial success of various initiatives, the EPLPC developed an agreement with Fisheries and Oceans Canada in 1997 to limit local fisheries and close two areas of prime lobster habitat to lobster harvesting. One benefit of these initiatives has been the ability of fish harvesters, government, community youth, academics, and scientists to work together and share information and knowledge for better management of the lobster fishery.

In 1999, the EPLPC approached Fisheries and Oceans Canada on establishing a Marine Protected Area (MPA) under the *Oceans Act* in the Eastport area. The EPLPC felt that establishing a MPA would support their current work and aid in implementing further conservation initiatives. There is scientific evidence that suggests that protecting the two areas of habitat has sustained and perhaps enhanced the local lobster fishery.

In October 2005, the Minister of Fisheries and Oceans Canada announced the designation of the Eastport Marine Protected Areas.

In addition to the above information on MPA's, the Canadian Prime Minister has instructed the Minister of Fisheries and Oceans, The Honourable Hunter Tootoo, to advance the Canadian Oceans agenda by the following action: *"Work with the Minister of Environment and Climate Change to increase the proportion of Canada's marine and coastal areas that are protected – to five percent by 2017, and ten percent by 2020 – supported by new investments in community consultation and science."* This direction was included in the Prime Minister's Mandate letter to impacted Ministers (http://pm.gc.ca/eng/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter).

Ecosystem

Ecosystem Impacts – Status

During the course of 30 years there have been changes on many features of the Newfoundland/ Labrador Shelf ecosystem. They include:

1. A major cooling of bottom waters occurred in the mid-1980s;
2. Zooplankton abundance was low in the 1990's when phytoplankton concentrations were high and the opposite pattern during the 1960s / early 1970s;
3. A number of groundfish species have declined while small pelagic species and commercially exploited invertebrate species have increased; and
4. Average body size of groundfish have declined along with curtailed condition and stunted growth.

Ecosystem models before and after the collapse have been developed to explore how the structure, function and key species of the ecosystem had changed (Bundy, 2000, 2001). Results of ecosystem models indicated there were changes in predator structure, trophic structure and energy flow. Biomass has significantly increased for forage fish species, and seals. Furthermore the ecosystem has changed from a demersal-feeder-dominated system to a pelagic-feeder-dominated system. Piscivore fish's abundance has increased, presumably because of the high abundance of small pelagic fish, and the ratio of pelagic feeders to demersal feeders has increased.

Management – Framework and Policies

Under the *Oceans Act* and the Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada, DFO is committed to the development of large-scale and local integrated management plans for all of Canada's oceans. This includes implementation by DFO of an Ecosystem Approach to management (EAM) in all activities for which it has management responsibility. The governance, regulation and management of activities within and surrounding the Atlantic Canadian waters are shared between a wide variety of government departments and agencies involved in, or with an interest in, the use and management of resources within its coastal, estuarine and marine environments. The process is intended to involve all stakeholders. There is a strategy in place that is being implemented and will continue to develop under new national policies.

Canada has developed a Sustainable Fisheries Framework (SFF) which builds on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the management of its fisheries to ensure continued health and productivity while protecting biodiversity and fisheries habitat. The primary goal of the SFF is to ensure that Canada's fisheries are environmentally sustainable, while supporting economic prosperity. It is designed to foster a more rigorous, consistent, and transparent approach to decision making across all key fisheries in Canada. It also incorporates existing policies with new and evolving policies using a phased-in approach, and develops tools to monitor and assess results of conservation and sustainable use in order to identify areas that may need improvement. Overall, the SFF provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada.

The Framework comprises two main elements: (1) conservation and sustainable use policies, and (2)

planning and monitoring tools.

The Conservation and Sustainable Use policies incorporate precautionary and ecosystem approaches into fisheries management decisions. These policies include:

- A Fishery Decision-Making Framework Incorporating the Precautionary Approach (April 2009)
- Managing Impacts of Fishing on Benthic Habitat, Communities and Species (April 2009)
- Policy on New Fisheries for Forage Species (April 2009)
- Ecological Risk Assessment Framework for Coldwater Corals and Sponges dominated communities (April 2013)
- Policy on Managing Bycatch (April 2013)
- Guidance on Implementation of the Policy on Managing Bycatch (April 2013)

The implementation process uses adaptive management principles, whereby experience applying the policies to fisheries management guide future applications. Integrated Fisheries Management Plans (IFMPs) continue to play a critical role as the primary resource management tool through which the Framework's policies are applied.

Ecosystem Science is the foundation for the science needed to support the integrated management of diverse human activities and is needed to inform departmental policies and management practices. DFO's Ecosystem Science Framework was developed to provide an effective and comprehensive approach for identifying, monitoring, and interpreting trends important to ecosystem sustainability and integrating knowledge about the effects of human activities on ecosystem components. A Five-Year Research Plan (2008-2013) has been developed to support the ecosystem science through its 20 components and their connections.

The Plan previously outlined how four of the priority areas would be addressed primarily through Ecosystem Research Initiatives (ERIs) that guide regional research priorities. Although the ERIs were recently concluded, they served to direct various activities including: Fish Population and Community Productivity, Habitat and Population Linkages, Climate Change/Variability, and Ecosystem Assessment and Management Strategies. Each of the ERIs, including the Centres of Expertise and the Climate Change Science Initiative strongly influenced by the Ecosystem Science Framework produced new knowledge and improved existing knowledge that was needed for integrated management. Each ERI served as a pilot for DFO's ecosystem-based approach by focusing on regional research priorities. This allowed integrated research on a particular ecosystem with predefined geographical boundaries and the knowledge gained from large-scale ecosystem studies allowed the development and testing of tools required to manage human activities within aquatic ecosystems.

DFO has many tools for protecting habitats and ecological areas, and adheres to federal policies and practices of good risk management and application of precaution. Identifying Ecologically and Biologically Significant Areas is not a general strategy for protecting all habitats and marine communities that have some ecological significance. Rather, it is a tool for calling attention to an area that has particularly high ecological or biological significance, to facilitate provision of a greater-than-usual degree of risk aversion in management of activities in areas of especially high ecological and biological significance (DFO 2004).

Ecologically and Biologically Significant Areas (EBSAs)

Canada's Oceans Act provides the legislative framework for an integrated ecosystem-approach to management in Canadian oceans, particularly in areas considered ecologically or biologically significant. The Oceans Act also commits Canada domestically to the development of a national network of MPAs within an integrated management planning context.

Ecologically and Biologically Significant Areas are geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics. **The identification of EBSAs is not meant to be a general strategy for protecting all habitats and marine communities**; rather it is a tool to call attention to areas that have particularly high ecological or biological significance to allow appropriate management. In this regard, it is important that results of EBSA identification are communicated clearly and concisely, and that EBSAs are defined in such as to support their use in policy and management decision-making.

Fifteen EBSAs were eventually identified and delineated in a the study area in Divisions 2GHJ+3K (see Figure 10 and Table 3.4): three in coastal areas (Nain Area, Lake Melville, and Gilbert Bay); seven in offshore areas (Outer Shelf Saglek Bank, Outer Shelf Nain Bank, Hopedale Saddle, Labrador Slope, Labrador Marginal Trough, Notre Dame Channel, and Orphan Spur); four spanning coastal and offshore areas (Northern Labrador, Hamilton Inlet, Grey Islands, and Fogo Shelf); and one transitory EBSA that encompasses the southern extent of pack ice. The static (i.e. spatially defined) EBSAs represent approximately 31% coverage within the study area. Seven of these EBSAs described below are either entirely or partially in Divisions 2J or 3K. The descriptions in Table 3.4 clearly indicate the dominant significant features leading to the identification of 14 EBSAs; as well as other important attributes that were noted to occur in the area.

Limitations of the Data: The Newfoundland and Labrador Shelves bioregion is data rich in many regards, but data are also limited in some aspects relative to the area considered (e.g. temporally and spatially uneven survey coverage occurs across the area). Dealing with information and data originating from multiple sources and various collection methods presented challenges in several regards (area very large, seasonality, wide range of depths, etc.).

An additional analysis (Templeman 2007) provided information on EBSA's from the Placentia Bay/Grand Banks Large Oceans Management Area (LOMA). This analysis described 11 EBSA's, with 4 of these occurring in Division 3L. All these EBSAs are shown in Figure 11 and the 3L EBSA's are described in Table 3.5.

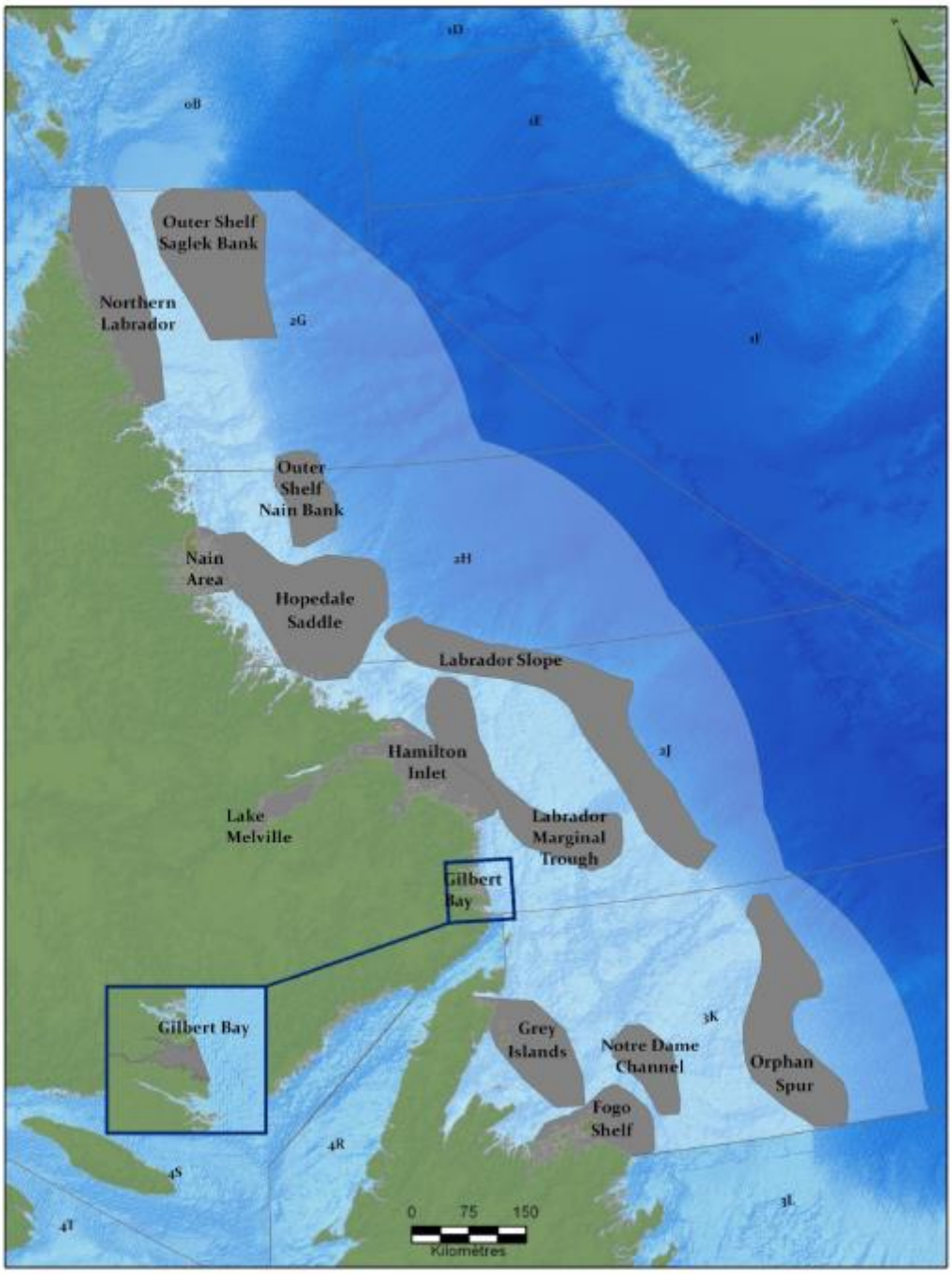


Figure 10*: The 14 static EBSAs identified and delineated in the Newfoundland and Labrador Shelves Bioregion study area.*

Table 3.4: Summary of physical, key biological, and other biological features found in each EBSA (2J3KL only).

EBSAs (NAFO Division	Physical Features	Key Biological Features	Other Biological Features
COASTAL EBSAs			
Lake Melville (2J)	Webb Bay, Tikkoatokak Bay, Nain Bay, Anaktalik Bay, Voisey Bay, Fraser River	Major colony of Thick-billed Murre Aggregations of several waterfowl and seabird species Common Eider colonies Seabird colonies Capelin spawning beach Highly productive area for Arctic Charr	High overall productivity in part due to unique aspects of the land-fast ice habitat Spawning salmon population Large congregations of Glaucous Gull 13 CCRI species
Gilbert Bay (2J)	Saltwater tidal extension of Hamilton Inlet; large fjord	Unique habitat (brackish waters) High productivity and species diversity Several freshwater, diadromous and marine fish species Salmonid spawning rivers and juvenile rearing areas Highest counts of moulting Surf Scoter in Eastern Canada High densities of breeding ringed seals	Numerous seasonal feeding aggregations of marine mammals
COASTAL AND OFFSHORE EBSAs			
Grey Islands (3K)	Hare Bay, Grey Islands, inner shelf southeast towards Fogo Island	High concentrations of a large diversity of waterfowl and seabird species, including Harlequin Duck (species of 'Special Concern' under *SARA*) Important colonies of several seabird species	Important coral concentrations Aggregations of Capelin (Campelen period) 25 CCRI species
Fogo Shelf (3K)	Bay of Exploits, North Twillingate Island, inner shelf area, Cape Freels, Fogo Shelf	Several beach and sub-tidal Capelin spawning areas Highly productive Atlantic Salmon areas Important area for several waterfowl and seabird species Largest Common Murre colony in the western North Atlantic Only breeding colony of Northern Gannet in the study area Important cetacean feeding area	Small benthivores (Campelen period) Male Hooded seals (Fall/winter) 36 CCRI Species

Table 3.4 (continued): Summary of physical, key biological, and other biological features found in each EBSA (2J3KL only).

EBSAs (NAFO Division	Physical Features	Key Biological Features	Other Biological Features
OFFSHORE EBSAs			
Labrador Slope (2HJ)	Labrador Slope, outer shelf, Hamilton Spur	High diversity of species High concentrations of several coral and sponge species Aggregations of all fish functional groups, several core species and several rare or endangered species	Aggregations of several seabird species, including Ivory Gull (endangered under *SARA*) Female and juvenile hooded seal aggregation area
Labrador Marginal Trough (2J)	Cartwright Saddle, Labrador Marginal Trough, Hawke Saddle, inside Hamilton Bank	Aggregations of several core fish species Potential corridor for several species of fish and marine mammals Area of highest probability of use for harp seal whelping Harp seal summer feeding area Cetacean feeding/migration area	Aggregations of several rare or endangered fish species (Engel period) PlankPiscivores (Campelen period) Aggregations of several fish functional groups (Engel period) Female and juvenile hooded seal aggregation area Aggregations of several seabird species, including Ivory Gull (endangered under *SARA*)
Notre Dame Channel (3K)	Notre Dame Channel, Middle Shelf	High diversity of species Cetacean feeding/migration area Important area for Skates Aggregations of several core fish species	Aggregations of several seabird species, including Ivory Gull (endangered under *SARA*) Harp seal winter feeding area
Orphan Spur (3K)	Orphan Spur, outer shelf, Labrador Slope	High diversity of species High concentrations of several coral species Aggregations of several fish functional groups, core species and rare or endangered species	Female hooded seal aggregation area Aggregations of several seabird species

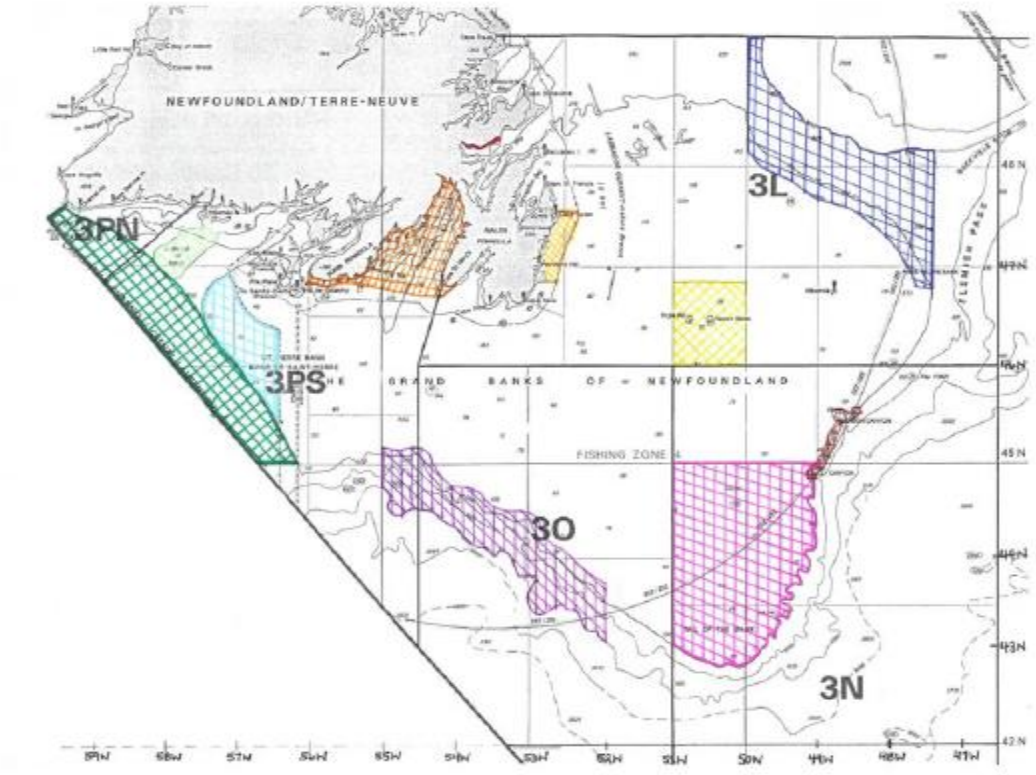


Figure 11. ***Placentia Bay Grand Banks Large Ocean Management Area: Ecologically and Biologically Significant Areas.***

Table 3.5. Description of EBSAs in Division 3L.					
EBSA Site (Name/ Description)	Uniqueness (Rarity)	Aggregation (Density/Concentration)	**Fitness Consequences** (Importance to Reproduction/Survival)	**Sensitivity** (Resilience to Disturbance)	**Naturalness** (State of Habitat)
Eastern Avalon Coast (5.0 points) Area from Blackhead to Cappahayden out to 100 m	**High – Biodiversity** Cetaceans, leatherback turtles, seals, and seabirds aggregate to feed in the spring to fall	**High- Feeding** Historic aggregation of many marine mammals - particularly in the summer	**High- Feeding** This area provides a potentially important feeding area for marine mammals – especially humpback whales; prey are concentrated here	**Low-** A naturally dynamic environment, with open access to larger oceanic areas	**High-** An area of low development to date; shipping traffic and fisheries could cause local disturbance
Lilly Canyon-Carson Canyon (4.0 points) Area from 44.8°N to 45.6°N along the 200 m isobath of the southeast slope of Grand Bank	**Low-** Although important to the feeding and productivity of Iceland Scallops, the species occurs elsewhere and the canyons themselves are not unique in that various other canyons occur throughout the Grand Banks.	**High- Feeding-** High proportion of Iceland scallops occur in Lilly and Carson Canyons (F. Cahill, DFO, pers. comm.; Ollerhead et al. 2004). **High- Feeding; Seasonal refuge-** Year round aggregation of marine mammals for feeding and overwintering	**High– Feeding-** High productivity (quick growth and high yields) for Iceland scallops occurs in the Lilly and Carson Canyons (F. Cahill, DFO, pers. comm.).	**Moderate-** While the shallower parts of the canyons have been heavily fished in the past, the area remains productive due to physical and biological oceanographic processes occurring there.	**High-** While the area of the Lilly Canyon-Carson Canyon has been heavily fished in the past, the area remains highly productive, and the deeper parts of the canyons are relatively undisturbed.
Northeast Shelf and Slope (3.5 points) Area on northeastern Grand Bank, starting at the Nose of the Bank, from 48°W to 50°W, and from the edge of the shelf to the 1000	**Low-** While the area may be deemed significant based on function to some species, it has no apparent uniqueness otherwise.	**High- Feeding-** Greatest proportion Spotted Wolffish (listed as "threatened" under COSEWIC) are aggregated here in spring (Kulka et al. 2003). **Moderate– Feeding-** Although broadly distributed along shelf edges, the highest concentration of Greenland	**High- Feeding-** Due to the "threatened" status of the Spotted Wolffish and the proportion of the population occupying the area, the northeastern edge of the Grand Banks is important to the species' short and long-term sustainability. **Moderate- Feeding** Potentially important feeding area	**Low-** The area of the northeast shelf and slope is not particularly sensitive compared to other slope areas occurring in the region.	**Moderate -**

m isobath		Halibut is aggregated here in spring (Kulka et al. 2003).	for marine mammals		

Table 3.5. Continued

EBSA Site (Name/ Description)	Uniqueness (Rarity)	Aggregation (Density/Concentration)	**Fitness Consequences** (Importance to Reproduction/Survival)	**Sensitivity** (Resilience to Disturbance)	**Naturalness** (State of Habitat)
Virgin Rocks (2.5 points) In the area from 46-46.8°N and from 50-51°W	**High- Physical Features-** This area is unique from a geological perspective, as these large nearly exposed rocks found near the middle of the bank constitute a one of a kind geological feature/ habitat in the LOMA.	**High- Feeding-** Seabirds are known to congregate in the vicinity of the rocks, as are their prey species, capelin. **Moderate- Spawning/Breeding** Groundfish – including Atlantic cod, American plaice and yellowtail flounder –aggregate in this general area to spawn; but also spawn over a disjunct range (Ollerhead et al. 2004).	**Moderate- Spawning/Breeding-** Although they are known to spawn elsewhere, the area surrounding the Virgin Rocks appears to be an important spawning area for several groundfish species – including Atlantic cod, American plaice and Yellowtail flounder (Ollerhead et al. 2004).	**Moderate-** The habitat surrounding the Virgin Rocks is less sensitive to disturbance but several of the traditionally abundant species in the area have been depleted so the community and ecosystem is less resilient.	**Moderate-** Natural disturbance is relatively high in this area so habitat is probably relatively intact. Intensive fishing has occurred in this area so the community and ecosystem has already been altered

Information

The marine ecosystem dynamics of the Labrador and Newfoundland have been well studied, particularly in respect to understanding groundfish population dynamics (Bundy et al 2000, 2001, NAFO 2012, 2011, Koen-Alonso 2013, Gaichas et al 2014, DFO 2015a, DFO 2015b)

The main impacts of the different gears under assessment can be inferred from existing information, which are well understood for target and incidental catch fish removals (through individual stock assessments, especially for key groundfish species), and any structural changes to key commercial fish populations (Bundy et al 2000, 2001, NAFO 2012, 2011, Koen-Alonso 2013, Gaichas et al 2014, DFO2015a, DFO 2015b).

Sufficient information is available on the impacts of the fishery on the target and incidental retained by-catch, discards, ETP species and habitats to allow the main consequences of the fisheries subject of this assessment on the ecosystem to be inferred. Information is sufficient to support the development of strategies to manage ecosystem impacts. These were present in the Groundfish Management Plan (2002-2007) and are expected to be considerably more advanced in the updated version of the plan.

3.5 Principle Three: Management system background

The Legal Basis and Scope of the Management System

There are 4 major pieces of legislation that are used by the Minister of Fisheries and Oceans and in some cases other Ministers in the management, control and protection of Canada's marine and freshwater resources:

- The Fisheries Act
- The Coastal Fisheries Protection Act
- The Oceans Act
- The Species at Risk Act

The Fisheries Act (http://www.dfo-mpo.gc.ca/Library/282791.pdf)

The Fisheries Act first received royal assent in 1868 and the last amendment occurred in 2013. The three fundamental subject matters dealt with in the legislation are the proper management and control of the fisheries, the conservation and protection of fish, and the protection of fish habitat and prevention of pollution. The two principal provisions used to manage and control fisheries are the Minister's licensing power under section 7 and the federal cabinet's regulation-making power under section 43. The first of these provisions allows for the inclusion of conditions on individual fishery licences to ensure proper management and control of specific fisheries. Case law suggests that, although the discretion is not totally unfettered, if the Minister stays within the framework of the Act and applies the principles of administrative law in making decisions with respect to licensing, he or she is not subject to challenge before the courts. The Fishery (General) Regulations apply generally to fishing and related activities in Canadian fisheries waters off the Atlantic, Pacific and Arctic Coasts, in the Atlantic Provinces and British Columbia, and in the Yukon Territory and the Northwest Territories. Additionally, the primary regulations used to control commercial east coast fisheries are the *Atlantic Fishery Regulations, 1985.*

Coastal Fisheries Protection Act (http://www.dfo-mpo.gc.ca/Library/282791.pdf)

The *Coastal Fisheries Protection Act* was enacted to regulate the harvesting of fisheries resources by foreigners in Canadian fisheries waters. The Department of Fisheries and Oceans patrols the fishing areas and enforces Canadian fisheries law within its 200-mile fisheries. The Act also provides for the management and protection of sedentary species on the continental shelf beyond the limits of Canadian fisheries waters. Additionally, amendments made to the Act in 1994, will prohibit classes of foreign fishing vessels from fishing for straddling stocks in the Regulatory Area of the Northwest Atlantic Fisheries Organization that lies outside Canadian fisheries waters.

The Oceans Act (http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/Governance-eng.htm#fed)

In 1997, Canada adopted comprehensive legislation for oceans management. By passing the Oceans Act Canada made a legal commitment to conserve, protect and develop the oceans in a sustainable manner. The Act is founded on three principles: sustainable development, integrated management, and the precautionary approach. The Act legally defines Canada's ocean boundaries and engages all Canadians interested in making decisions that affect them and their ocean environment. The Minister of Fisheries and Oceans Canada has the federal responsibility for new and emerging ocean-related activities not previously assigned by Parliament.

The Species at Risk Act (https://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=ED2FFC37-1)

The Species at Risk Act (SARA) was adopted in 2002. This completed the Canadian National Strategy for the Protection of Species at Risk. The purposes of the SARA are to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species that are extirpated (no longer exist in the wild in Canada), endangered, or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened. A series of measures applicable across Canada provides the means to accomplish these goals. Some of these measures establish how governments, organizations, and individuals in Canada work together, while others implement a species assessment process to ensure the protection and recovery of species. Some measures provide for sanctions for offences under SARA.

NAFO

The portion of the 2J3KL stock that is located outside Canada's 200 mile EEZ is managed by the Northwest Atlantic Fisheries Organization. This portion is relatively small. Murphy (1997) reported that, "*Surveys conducted during autumn for the years 1981-92 in Div. 2J3KL indicated that only a small portion, less than 1%, of the total 2J3KL biomass occurs in the NAFO Regulatory Area (NRA) at that time. In 1993 this portion increased to 5 % in the NRA and was< 1 % in 1995 and 1996*."

Canada negotiated a solution with other NAFO contracting parties to address this and now the NAFO Conservation and Enforcement document contains measures to address the quota management of 2J3KL cod in the NRA. Article 7 of the 2014 NCEM contains the following respecting 2J3KL cod:

Cod in Divisions 2J3KL

1. The Fisheries Commission shall obtain annually the decision of Canada on the limit it has established for catches by Canadian fishers. This limit shall be 95% of the TAC for this stock.
2. The Fisheries Commission shall establish a catch limit in the Regulatory Area that shall apply to the other Contracting Parties. This limit shall be 5% of the TAC for this stock.
3. The total of the catch limits set in accordance with paragraphs 1 and 2 shall constitute the TAC for 2J3KL cod.
4. The distribution key that shall apply for the 5% figure when the fishery in the Regulatory Area is resumed shall be 65.4% for the EU and 34.6% for the other Contracting Parties.
5. The measures in this Article shall apply when a decision is taken to allow the resumption of fishing for cod in the Regulatory Area, and shall not serve as a precedent in future years for establishing catch limits of criteria for quota allocations of other stocks.

Land Claims

Legislation has been enacted by the Parliament of Canada to give effect to three land claim agreements in areas near or within 2J3KL. The Nunavut Land Claims Agreement Act, the Labrador Inuit Land Claims Agreement Act and the Nunavik Inuit Land Claims Agreement Act contain provisions for the access, allocation and management of fisheries in the settlement areas of the land claims. Those areas include the marine waters within Canada's 12-mile limit. Management bodies created as a result of the agreements exercise jurisdiction over fisheries matters in the settlement areas including harvesting and licensing to fish.

Consultation Processes

DFO implemented a formal Consultation Policy in 2004 (http://www.dfo-mpo.gc.ca/Library/282187.pdf). This policy indicates DFO's commitment to improved consultations. The principles outline common approaches to consultations within DFO and with stakeholders. It should be noted, however, consulting with Aboriginal groups involves special considerations and those considerations are described in separately in this policy document.

The following is the DFO policy statement on consultations: Fisheries and Oceans Canada (DFO) will undertake consultations in order to improve departmental decision-making processes, promote understanding of fisheries, oceans and marine transport issues, and strengthen relationships.

In addition to the Consultation Policy, DFO posts consultation calendars on National as well as regional websites (http://www.nfl.dfo-mpo.gc.ca/NL/CC/consultations-calendar-2015). The consultations listed in these calendars are broad in nature and are focussed on issues that have interest to wide array of organizations and the general public.

There are many specific references to various governance and consultation processes for 2J3KL cod throughout the DFO literature posted on its website. The Governance Section of the 2J3KL Groundfish Management Plan published in 2013 describes how consultation occurs: "*Groundfish management is conducted through advisory processes. The advisory committee solicits the opinions of stakeholders on past management practices and focuses on management measure recommendations for future groundfish fisheries. This includes recommendations on the Total Allowable Catch (TAC).*" (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/groundfish-poisson-fond/groundfish-poisson-fond-div2-3KL-eng.htm). The management decisions for 2J3KL cod also described that additional consultation with industry participants is required to finalize additional management measures (e.g. Seasons).

Long Term Objectives

DFO's Guidance Document for the development of Integrated Fisheries Management Plans (IFMPS) (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/guidance-guide/preparing-ifmp-pgip-elaboration-eng.htm) includes the following: "The range of objectives and management measures as outlined in IFMPs will be developed in consideration of fisheries policies regarding benthic habitat, forage species, by-catch (retained and non-retained) and relevant policies and planning processes from other sectors (i.e. Integrated Ocean Management planning process, Marine Protected Area (MPA) network planning and the departmental Ecosystem Approach to Management (EAM)). IFMPs will incorporate limit reference points developed within the framework of the precautionary approach, as well as associated decision rules".

A general long-term objective for Fisheries and Oceans Canada in described in broad terms (http://www.dfo-mpo.gc.ca/oceans/oceans-eng.htm): *"DFO strives to safeguard Canada's healthy and productive aquatic ecosystems and thus helps to maintain sustainable resources for Canadians by adopting an integrative approach for improved management and conservation of our oceans."*

Fisheries: DFO manages fisheries in accordance with the roles and responsibilities outlined in the *Fisheries Act*, using credible, science-based, affordable and effective practices. Key priorities for fisheries management in Canada include: environmental sustainability; economic viability; and the inclusion of stakeholders in decision-making processes.

Long-term objectives for sustainable fisheries need to address (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/guidance-guide/template-app-a-ann-modele.eng.htm#n3.5)

- Stock Conservation
- Ecosystem
- Stewardship
- Social, cultural, and economic (i.e. commercial, recreational, Aboriginal)
- Compliance

The long term objective included in the Draft 2J3KL Cod Conservation and Rebuilding Plan is to achieve and maintain the 2J3KL Cod Spawning Stock Biomass (SSB) at or above maximum sustainable yield (MSY), and to provide reasonable fishing opportunities during the rebuilding period

Fishery Specific Objectives

The 2J3KL cod stock is currently below the defined biomass limit reference point (LRP) determined in 2010. There has been some growth in this stock during the recent period with the Spawning Stock Biomass average of the past 3 year at 26% of the LRP. A generally understood annual fisheries specific objective is simply to maintain removals at the lowest possible level while allowing the spawning stock to rebuild to a healthy level.

Decision-Making Process

Groundfish management is conducted by DFO through advisory processes. The advisory committee solicits the opinions of stakeholders on past management practices and focuses on management measure recommendations for future groundfish fisheries. This includes recommendations on the Total Allowable Catch (TAC).

Ministerial approval of TACs for is required while approval of the "Evergreen" Integrated Fisheries Management Plan (IFMP) for Groundfish in 2J3KL (including 2J3KL cod) is the responsibility of the Regional Director, Fisheries Management, Newfoundland and Labrador Region. Recommendations from all stakeholder groups on TACs and all management measures are considered in the development of the IFMP. Decision making for opening and closing dates in specific areas and gear types is done in consultation with industry as well as DFO Area Staff. Other issues that arise during the lifetime of this plan will be addressed through similar consultative processes.

Monitoring, Control and Surveillance

The stewardship fishery is monitored using observers, dockside monitoring and Fishery Officers while the recreational groundfish fishery is monitored solely by Fishery Officers. Dockside monitoring for

the stewardship fishery in 2J3KL is conducted approximately 1/3 of all landing sites ports at a rate of 100% coverage, while the remaining ports receive random monitoring.

The following information describes the enforcement activity by DFO Fisheries Officers during the past 3 years (Source: DFO Enforcement):

Recreational Groundfish Fishery

	2012-13	2013-14	2014-15
Total Patrol hours	3702.5	3803	3722
Number of Charges	51	36	53
Number of Warnings	28	17	22

Stewardship Cod Fishery

	2012-13	2013-14	2014-15
Total Patrol hours	1357.5	1153.5	1414.5
Number of Charges	17	35	9
Number of Warnings	13	25	23

Most of the charges in the recreational fishery were related to bag limits, while the charges in the stewardship fishery were dominated by catch reporting and licencing issues.

It can be concluded from this information that there is no wide-spread non-compliance in this fishery.

Monitoring and Evaluation of the 2J3KL Cod Management System

All parts of the management system are subject to public evaluation through meetings of DFO personnel and related science and management committees.

Performance of the fishery is evaluated at annual stock assessment meetings and revised CHP's respond to the needs of management.

DFO conducts Post-season analyses for all fisheries on an annual basis. The 2015 post analysis (for the 2014 fishing season) occurred on January 13-14, 2015. These sessions have been conducted since at least 1999 and provide a forum for discussions between fisheries management, enforcement, science, policy & economics, statistics, licencing and communications. The agenda for the 2015 meeting included discussion of a number of fisheries including the 2J3KL stewardship fishery as well as the groundfish recreational fishery. Various program components are also discussed annually, such as: licencing, statistics, dockside monitoring and the vessel monitoring policy and program.

The House of Commons Standing Committee on Fisheries also provides an occasional external review of fisheries issues. Some of the topics reviewed and analyzed by this committee included (http://www.parl.gc.ca/Committees/en/FOPO/StudyActivity?studyActivityId=3045814):

- Changing Ocean Conditions or Other Factors Off the Coast of Newfoundland and Labrador that have Led to Stock Fluctuations in Northern Shrimp and Other Species (2014)
- Eco-Certification in the Fisheries Sector (2010)
- Northern cod (2006)

4 Evaluation Procedure

4.1 Assessment methodologies used

This pre-assessment report was prepared under The MSC Fisheries Certification Requirements and Guidance v2.0, Issued 1st October 2014 and Effective 1st April 2015.

4.2 Summary of site visits and meetings held during pre-assessment

Various conference call meetings were held with the client representatives, World Wildlife Fund (WWF) and Fish Food and Allied Workers (FFAW) during the period of the pre-assessment. A series of meetings that included a presentation of the pre-assessment work and discussions to address issues of interest were held at various locations in St. Johns, Newfoundland and Labrador during January 11-14, 2016.

Meeting Schedule:

Date - 2016	Meeting
January 11	Introductory meeting with FIP participants (WWF,FFAW, Fogo Co-op, Fish Harvester representative)
January 11	Dr. Sherrylynn Rowe, Scientist (MUN-MI)
January 12	DFO (Science, Fisheries Management, Policy, Ecosystem Management)
January 12	Dr. Noel Cadigan, Scientist (MUN-MI)
January 13	Newfoundland & Labrador, Dept. of Fisheries and Aquaculture
January 13	Concluding meeting with Client FFAW
January 14	Concluding meeting with WWF

4.3 Stakeholders to be consulted during a full assessment

The following stakeholders were identified during the pre-assessment stage. Further stakeholders may be added to the list during any initiation of a full assessment.

- World Wildlife Fund (WWF) — eNGO
- Ecological Action Center — eNGO
- Fish Food and Allied Workers (FFAW) — Industry (Harvesting)
- Department of Fisheries and Oceans (DFO) — Science/Management
- NAFO — RFMO
- Fogo Fisheries Cooperative — Industry (Harvesting/Processing)
- Seafood Producers of NL (SPONL) — Industry (Processing)
- Memorial Univ. of NL – Marine Institute (MUN-MI) — Science
- Association of Seafood Producers (ASP) — Industry (Processing)
- Groundfish Enterprise Allocation Council (GEAC) — Industry (Harvesting)

4.4 Harmonisation with any overlapping MSC certified fisheries

There are currently no overlapping MSC certified fisheries for 2J3KL Cod Fisheries.

5 Traceability (issues relevant to Chain of Custody certification)

5.1 Eligibility of fishery products to enter further Chains of Custody

This report deals only with the harvesting of 2J3KL Cod from the stewardship fishery at the point of landing, and not beyond processing which constitutes the first step in the chain-of-custody process. All cod harvested by the registered fleet of inshore vessels in Divisions 2J3KLs will be eligible to display the MSC logo. However, only those companies that have a certificate sharing arrangement with the client group, may carry the MSC label and claim forward through the MSC chain of custody.

Traceability within the fishery

Canada has created a Catch Certification Program (CCP) (http://www.dfo-mpo.gc.ca/fm-gp/ccp-pcc/auditoff-eng.htm) in response to the European Union's Illegal, Unreported, and Unregulated (IUU) fishing regulation. This program was implemented on January 1, 2010. It requires that fish exports to the EU are accompanied by a catch certificate issued by the competent authority in the country of origin.

Fisheries and Oceans Canada is the competent authority that is solely responsible for the administration of Canada's Catch Certification Program. Since the establishment of the Program in December 2009, it is now also issuing export permits and responding to other international catch certification requirements, as they arise. The Program consists of the following elements:

1a. Catch Certification Program: Operations Centre (CCP: OC)
1b. Catch Certification Program: Integration and Planning Bureau (CCP: IPB)
2. Fisheries Certificate System (FCS)
3. Catch Certification Audit Office (CCAO)

The Catch Certification Audit Office will apply a traceability process (consisting of a combination of data obtained from industry, DFO databases and open source information) to verify that the fish exported can be traced back to the vessel or vessel group identified in the certificate application as well as to the time and area of capture. The types of records that may be used for certification purposes include purchase slips, invoices, bills of lading, production records and dockside tally sheets. The audit process also includes a compliance assessment of the fishing vessel or group of fishing vessels and their operator(s).

6 Preliminary evaluation of the fishery

6.1 Applicability of the default assessment tree

The pre-assessment found that there is sufficient information available for conducting an assessment with the default assessment tree.

6.1.1 Expectations regarding use of the Risk-Based Framework (RBF)

The pre-assessment found that there is sufficient information available that precludes utilization Risk Based Framework. (RBF). An RBF is a set of risk-assessment methods used to evaluate certain performance indicators within the assessment tree in situations where quantitative data is too limited to use the default scoring guideposts.

The pre-assessment determines that the use of RBF is not necessary for a full assessment of the 2J3KL cod stewardship fishery.

6.2 Evaluation of the fishery

Principle 1

The results show that the 2J3KL Cod Stock has been rebuilding with the Spawning Stock Biomass increasing regularly during the past 6 years, however the SSB is still well below the established Limit Reference Point for this stock. This SSB for this stock will need to be increased above the point where recruitment would be impaired and a rebuilding timeframe shall be specified for the stock for this fishery to be a candidate for MSC full assessment.

Some other deficiencies that have been identified for this fishery in Principle 1 are:

- There has not been a rebuilding timeframe determined for this stock
- There is only a single reference point identified (LRP). No other reference points (e.g. upper stock, target or fishing mortality reference points have yet to be determined).
- While there is a single generally understood harvest control rule, there are no explicit harvest control rules based on various levels of SSP.
- There are currently no estimates of the recreational cod catch. This fishery utilize different types of hand lines gear compared to the stewardship handline fishery. In the meantime scientists conclude that the current exploitations levels are low and removals from various fisheries have very little impact on stock population dynamics.

A rebuilding strategy for 2J3KL cod with a rebuilding timeframe that is the shorter of 20 years or 2 times its generation time along with continued monitoring will be required for this fishery to proceed to full MSC assessment. In addition, a full suite of precautionary approach reference points, the development of a series of well-defined Harvest Control rules and a process to determine estimates for the recreational catch will also be required for this fishery.

Principle 2

The pre-assessment indicates that there are no primary or secondary species for the Stewardship fishery of 2J3KL cod. There was an issue with the evaluation of bait species as data was not provided on this issue by DFO.

There is sufficient information available to adequately determine there is minimal risk posed by the fishery on ETP species identified (spotted and striped wolfish and leatherback turtles). There is a strategy to effectively manage these species (Species at Risk log books, mandatory live release requirements with associated training, etc). Information is also adequate to determine the risk posed to habitat types and ecosystems by the fishery and the effectiveness of the strategy to manage impacts on habitat types and ecosystems.

There is also evidence that the fishery is highly unlikely to reduce habitat structure and Vulnerable Marine Ecosystem (VME) habitats and ecosystem function to a point where there would be serious or irreversible harm. There have been several "Ecologically and Biologically Sensitive Areas" defined throughout the 2J3KL zone. In addition, 2 MPAs have been defined and the Canadian government has committed to protect up to 10% of the marine environment by 2020. The definition of the EBSAs is a precursor to this additional work in defining MPAs.

Principle 3

The main fisheries authority is the Canadian Department of Fisheries and Oceans. The Northwest Atlantic Fisheries Organization (NAFO) has authority for a small portion of Division 3L outside the Canadian 200 mile EEZ. Long term objectives to guide decision making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy. These are outlined through DFO's Sustainable Fisheries Strategy and in the development Integrated Fishery Management Plans. A single fishery-specific objective is generally understood: that is the fishery removals (and exploitation rate) should be maintained at a low level to allow for continued rebuilding of this stock. There is a high level of compliance, control and surveillance (MCS) for the 2J3KL cod fishery.

Overall Conclusion/Recommendation

On the completion of the analysis and scoring of the Canadian fishery for Cod in NAFO Divisions 2J3KL against the MSC Criteria and Principles, using MSC CR v.2.0, it is recommended that when this fishery reaches the biomass limit (Blim) determined for this stock and additional work is completed (a full suite of reference points and harvest control rules are developed, an explicit rebuilding time frame <20 years is determined and an estimate of recreational catch developed) it can move forward to a full MSC assessment process.

6.2.1 Other issues specific to this fishery

No other issues have been identified

6.3 Summary of likely PI scoring levels

UoA 1 Gillnet: Principle 1

Principle	Component	Performance Indicator (PI)		Score
P1	Outcome	1.1.1	Stock status	<60 Failed
		1.1.2	Stock rebuilding	60-79 Pass with conditions
	Management	1.2.1	Harvest strategy	>80 Pass
		1.2.2	Harvest control rules & tools	60-79 Pass with Conditions
		1.2.3	Information & monitoring	60-79 Pass with Conditions
		1.2.4	Assessment of stock status	>80 Pass

UoA 1 Gillnet: Principle 2

P2	Primary species	2.1.1	Outcome	>80 Pass
		2.1.2	Management strategy	>80 Pass
		2.1.3	Information/Monitoring	>80 Pass
	Secondary species	2.2.1	Outcome	>80 Pass
		2.2.2	Management strategy	>80 Pass
		2.2.3	Information/Monitoring	60-79 Pass with conditions
	ETP species	2.3.1	Outcome	>80 Pass
		2.3.2	Management strategy	>80 Pass
		2.3.3	Information strategy	>80 Pass
	Habitats	2.4.1	Outcome	>80 Pass
		2.4.2	Management strategy	>80 Pass
		2.4.3	Information	80 Pass
	Ecosystem	2.5.1	Outcome	>80 Pass
		2.5.2	Management	>80 Pass
		2.5.3	Information	>80 Pass

UoA1 Gillnet: Principle 3

P3	Governance and policy	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	>80
		3.2.2	Decision making processes	>80
		3.2.3	Compliance & enforcement	>80
		3.2.4	Monitoring & management performance evaluation	>80

UoA 2 Longline: Principle 1

Principle	Component	Performance Indicator (PI)		Score
P1	Outcome	1.1.1	Stock status	<60 Failed
		1.1.2	Stock rebuilding	60-79 Pass with conditions
	Management	1.2.1	Harvest strategy	>80 Pass
		1.2.2	Harvest control rules & tools	60-79 Pass with Conditions
		1.2.3	Information & monitoring	60-79 Pass with Conditions
		1.2.4	Assessment of stock status	>80 Pass

UoA2: Longline: Principle 2

P2	Primary species	2.1.1	Outcome	60>79 Pass with Conditions
		2.1.2	Management strategy	60>79 Pass with Conditions
		2.1.3	Information/Monitoring	>80 Pass
	Secondary species	2.2.1	Outcome	60>79 Pass with Conditions
		2.2.2	Management strategy	60>79 Pass with Conditions
		2.2.3	Information/Monitoring	60>79 Pass with Conditions
	ETP species	2.3.1	Outcome	>80 Pass
		2.3.2	Management strategy	>80 Pass
		2.3.3	Information strategy	>80 Pass
	Habitats	2.4.1	Outcome	>80 Pass
		2.4.2	Management strategy	>80 Pass
		2.4.3	Information	80 Pass
	Ecosystem	2.5.1	Outcome	>80 Pass
		2.5.2	Management	>80 Pass
		2.5.3	Information	>80 Pass

UoA2 Longline: Principle 3

P3	Governance and policy	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	>80
		3.2.2	Decision making processes	>80
		3.2.3	Compliance & enforcement	>80
		3.2.4	Monitoring & management performance evaluation	>80

UoA 3 Handline: Principle 1

Principle	Component	Performance Indicator (PI)		Score
P1	Outcome	1.1.1	Stock status	<60 Failed
		1.1.2	Stock rebuilding	60-79 Pass with conditions
	Management	1.2.1	Harvest strategy	>80 Pass
		1.2.2	Harvest control rules & tools	60-79 Pass with Conditions
		1.2.3	Information & monitoring	60-79 Pass with Conditions
		1.2.4	Assessment of stock status	>80 Pass

UoA3: Handline: Principle 2

P2	Primary species	2.1.1	Outcome	60>79 Pass with Conditions
		2.1.2	Management strategy	60>79 Pass with Conditions
		2.1.3	Information/Monitoring	>80 Pass
	Secondary species	2.2.1	Outcome	60>79 Pass with Conditions
		2.2.2	Management strategy	60>79 Pass with Conditions
		2.2.3	Information/Monitoring	60>79 Pass with Conditions
	ETP species	2.3.1	Outcome	>80 Pass
		2.3.2	Management strategy	>80 Pass
		2.3.3	Information strategy	>80 Pass
	Habitats	2.4.1	Outcome	>80 Pass
		2.4.2	Management strategy	>80 Pass
		2.4.3	Information	80 Pass
	Ecosystem	2.5.1	Outcome	>80 Pass
		2.5.2	Management	>80 Pass
		2.5.3	Information	>80 Pass

UoA3 Handline: Principle 3

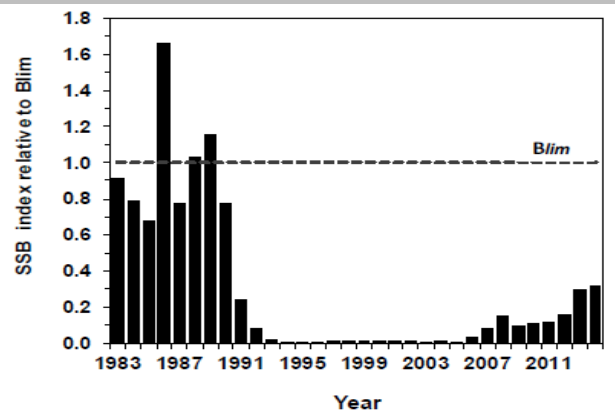
P3	Governance and policy	3.1.1	Legal &/or customary framework	>80
		3.1.2	Consultation, roles & responsibilities	>80
		3.1.3	Long term objectives	>80
	Fishery specific management system	3.2.1	Fishery specific objectives	>80
		3.2.2	Decision making processes	>80
		3.2.3	Compliance & enforcement	>80
		3.2.4	Monitoring & management performance evaluation	>80

Table 6.3 Simplified Scoring sheet
Principle 1. Scores are for all UOCs combined

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
1	Outcome	1.1.1	Stock status	N	Fail (<60)	There are some positive indications from the latest full stock assessment and stock status updates: • Stock assessment Indices from the autumn DFO RV survey and the Sentinel survey were generally higher in 2014, particularly in the north (Divs. 2J and 3K), indicating improvement in overall stock status. • Recent recruitment has improved, but is not expected to result in major changes to SSB relative to the LRP in 2015. • Tagging results indicated that exploitation levels continued to be low (≤ 5%) in 2014. • In 2013, scientists concluded that estimates of current exploitation rates show that fishery removals are a minor component of total mortality rates and have had little impact on recent stock dynamics (DFO 2013c). This was reiterated in 2015 (DFO 2015b). However, estimated SSB has been well below the LRP since the early 1990s. The estimate of 2012 SSB is 15 % of the LRP. The 2011-2013 average SSB is 19% of the LRP while the 2012-2014 average is 26%. Scientists concluded that at current levels of SSB the stock is considered to have suffered serious harm and the ability to produce good recruitment remains seriously impaired. Based on the current level of SSB the fishery fails. This SSB for this stock will need to increase above the point where recruitment would be impaired to receive a higher score on this PI.

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
		1.1.2	Stock rebuilding		Fail (<60%)	The 2J+3KL cod SSB and recruitment remain at extremely low levels compared to the 1960's. SSBs in the 1980's were the last to produce medium levels of recruitment. After the 1980's SSB has been low and recruitment poor, indicating that the stock has been below a level where serious harm occurs. Based upon the autumn DFO surveys the SSB in 2005 was only 1% of the limit reference point (LRP), the three year average SSB increased to 12% of the LRP in 2010-2012, 18% in 2011-13 and 26% in 2012-2014. While the stock has shown some improvement after 2005 it has remained below the LRP (in the critical zone) since the early 1990s. Monitoring is occurring using annual research vessel surveys which are reported regularly at full stock assessments or assessment updates. While there is evidence the stock is rebuilding, there is no specific time frame defined for this stock to rebuild to the biomass limit. Therefore the score for this PI is less than < 60% (Fail). A rebuilding strategy for 2J3KL cod with a rebuilding timeframe that is the shorter of 20 years or 2 times its generation time along with continued monitoring will be required for this PI to achieve a higher score.
						The cod fishery in Divisions 2J3KL is managed by the Department of Fisheries and Oceans through the 2013 Groundfish Integrated Fisheries Management plan in conjunction with annual TAC decisions

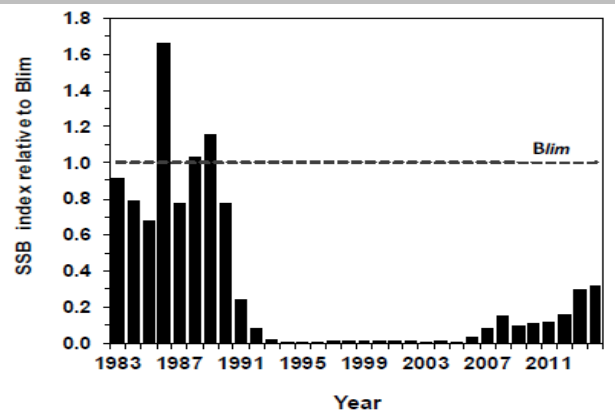
Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
	Management	1.2.1	Harvest Strategy		Pass (≥80)	announced by the Minister and Conservation Harvesting Plans negotiated with fish harvesters. Some of the management measurements include gear restrictions, seasons, area restrictions by-catch and small fish protocols, mandatory landing of all species, as well as closed areas (MPAs). The management plan in place is supported by an operational framework with considerable stakeholder participation, scientific research, stock monitoring, comprehensive assessments and peer reviews. The fishery has a biomass limit reference point; it also has a generally understood harvest control rule (to keep the removals of cod at the lowest possible level). Scientists have concluded during the 2013 full assessment and the 2015 assessment update that estimates of current exploitation rates derived from tagging are low ($\leq 5\%$) and that fishery removals are a minor component of total mortality rates and have had little impact on recent stock dynamics. SSB in relationship to LRP: 2005 1% of LRP, 2010-2012 average 12% of LRP 2011-2013 average 18% 2012-2014 average 26%. A figure of the actual annual SSB index from the assessment using the SURBA assessment model is shown below:

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						 The evidence above regarding the low exploitation rates for this fishery and the regular increases in SSB indicates that while the harvest strategy has not been fully tested it is meeting the objective of continue stock growth. There are regular reviews of the status of the SSB in relation to the LRP. Research vessel surveys are conducted annually and there is a full stock assessment completed every 3 years and in intervening years there is a stock status update completed. This provides the monitoring needed to determine if the strategy is working. The by-catches of 2J3KL cod in fisheries for other species are quite low. These were reported to be 18t in 2014 from Canadian fisheries inside 200 miles in 2J3KL (DFO, 2015d) and 133t from non-Canadian fleets outside 200 miles in 3L (http://www.nafo.int/data/frames/data.html). The level of bycatch

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						in monitored on an annual basis. Given the low level of bycatch (3.2% of the total reported catch in 2014) there is no practical requirement to evaluate alternative measures to minimize bycatch mortality. Given all of the above evidence the score for this PI is ≥80 (Pass).
		1.2.2	Harvest control rules and tools		**Pass with Condition (60-79)**	While there are no well-defined biomass based decision rules at this point, there is a single generally understood harvest control rule currently in place for this stock. That is to keep the removals of cod at the lowest possible level to enable the SSB to rebuild to the LRP level. Information above related to the **low exploitation rates for this fishery and the regular increases in SSB** indicates that the generally understood HCR for this stock is appropriate and effective in controlling exploitation. The score for this PI is 60-79 (Pass with Condition) The development of a series of well-defined Harvest Control rules that will ensure that appropriate levels of exploitation occurs within the various limits of a full precautionary approach framework will result in a higher score for this PI.
		1.2.3				For the cod stock in Divisions 2J3KL the background section in the earlier portion of this paper indicated there is considerable information available on stock productivity, fleet composition, stock abundance and fishery removals. Information on environmental factors is also reported during full assessments (DFO, 2013c) and at other times (DFO, 2015d).

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
			Information and monitoring (Gillnets UoA1, Longlines UoA2 & Hand lines UoA3)		Pass with Condition (60-79)	Stock abundance and UoA removals are monitored through the evaluation of exploitation rates derived from tagging, SSB indices derived from Research Vessel surveys, the evaluation of logbooks as well as dockside monitoring. These indicators are fully evaluated every 3 years and are updated annually. This annual updating is a sufficient frequency to support the harvest control rule. In the meantime, there are no available estimate of removals from the recreational fishery. Additionally, results from tagging suggest the recent removals from the recreational/food fishery can be substantial. Even with the lack of an estimated total cod catch caused by the absence of recreational fishery removals, scientists still conclude that exploitation rates for this stock are very low and the fishery has very little impact on stock dynamics. Recent stock assessments have been survey based (catch not required), however upcoming assessments will require determination of total catch, thus estimation of recreational fishery removals will be important. As a result of the lack of an estimate of recreational catch the score for this PI is 60-69 (Pass with Condition). A process to determine estimates for the recreational catch will be required to increase the scoring for this PI.

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
		1.2.4	Assessment of stock status		Pass (≥80)	The stock assessment methods for Cod in Divisions 2J3KL are appropriate for the stock population dynamics and for the generally understood harvest control rule of keeping fishing mortality at a very low level. Clearly the current methods take into account some major features relevant to the biology of the species and the dynamics of the fishery. Research vessel surveys, sentinel survey data, results from tagging, hydro-acoustic surveys and analysis of commercial catch and effort from the stewardship fishery all contribute to the assessment of this stock. These are well known elements of many assessment processes. A cohort analysis of the autumn research vessel survey data (SURBA; **SUR**vey **BA**sed model) is used to produce estimates of spawning stock biomass (SSB). This assessment model has been used regularly for NL assessments. There are also on-going processes to evaluate other assessment models for their potential use in the 2J3KL stock assessment. There was recently a review to evaluate the utility of space state models (Cadigan, 2015). This assessment technique will be attempted at the next full assessment in March 2016. These framework sessions have Canadian as well as international peer review. It has been confirmed in discussion with the scientist who developed this new model (N. Cadigan) that testing has revealed that the model results do not exhibit a retrospective pattern. One of the key indicators of stock status for this stock is the SSB determined from the SURBA model compared to the Blim for this stock. A figure showing this comparison is presented here:

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
						 Sources of uncertainty are considered at each full assessment of the 2J3KL cod stock. These are reported in the published stock status reports (DFO 2013c). The assessment of stock status for 2J3KL is completed by DFO scientists who specialize in cod assessments. These assessments are peer reviewed by other DFO scientists as well as scientists from Memorial University of Newfoundland and those hired by various industry associations. Given the above the score for this PI is Pass (80).
	Number of PIs less than 60					2

UoA 1. Gillnet

2	Primary Species	2.1.1	Outcome	N	Pass (≥80)	**There is a high degree of certainty that main primary species are above PRI and are fluctuating around a level consistent with MSY Minor primary species are highly likely to be above the PRI.** From Aldous 2011: Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main and minor primary species (>5% of the catch) in this fishery. SG80 scoring issue will probably be met
		2.1.2	Management		Pass (≥80)	**There is a strategy in place for the UoA for managing main and minor primary species.** **Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or species involved.** **There is clear evidence that the partial strategy/ strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue** From Aldous 2011 Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main retained species (>5% of the catch) in this fishery. As there are no main primary species there is need for management strategies. SG80 scoring issue will probably be met

	2.1.3	Information		Pass (≥80)	**Quantitative information is available and is adequate to assess, with a high degree of certainty, the impact of the UoA on main primary species with respect to status**. There is information on the quantities of retained species from the 2J3KL fishery for the major gears (gillnets, longline) and to somewhat extent to handline. The assessment Team considers that sufficient data is collected to detect any increase in risk level. There is retained species status using age composition of landings, size and age composition of the population, and trends in relative abundance derived from survey biomass indices. All groundfish species must be landed and recorded in a logbook supported by dockside monitoring and independent observer coverage. SG80 scoring issue will probably be met
Secondary species	2.2.1	Outcome	N	Pass (≥80	**There is a high degree of certainty that main secondary species are above biologically based limits.** No Main Secondary Species have been found on GN gear.
	2.2.2	Management		Pass (≥80	**There is a high degree of certainty that main secondary species are above biologically based limits.** No Main Secondary Species have been found on GN gear.
	2.2.3	Information		Pass with Condition (60-79)	**Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.** Catch and discard data in the fishery are collected by on board by fisheries observers, Landings and effort data are recorded by DFO based on port sampling and vessel logbooks However the observer coverage is very low (0.8%). Due that the observer coverage is very low, it is difficult to say that there is

						accurate and verifiable information on the catch of all secondary species and the consequences for the status of affected populations
	ETP species	2.3.1	Outcome	N	Pass (≥80	**The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.** Three ETP species are known to occur in the 2J3KL area. Two of these three species are wolffishes (Northern and spotted). The third species is Leatherback turtle. **Wolffishes:** Reported wolffish catches were relatively high in the 1970s and declined in the 1990s. Since 2006, the lowest values since the start of the data series have been recorded, probably partly due to the requirement to release Northern and Spotted Wolffish under SARA. Although reported wolffish catches once exceeded 8,000 mt, current values are approximately 200 mt annually. Commercial log data under-report wolffish catch rates (Kulka *et al.* 2007), and close to half of Atlantic Wolffish bycatch in Canada is believed to be discarded without being reported (Simpson and Kulka 2002). Landed values therefore underestimate actual catches. It has been presumed that fishing mortality from bottom gears has been the primary cause of death due to a loss of buoyancy from depleted blubber reserves (there is no directed fishery for wolffish). With the passage of SARA and the requirement for live release (except in a very specific case of a limited fishery for Atlantic Wolffish), Canadian reported landings of unspecified wolffish in Subarea 2 and Div. 3KLNO of Canada's EEZ decreased to zero by 2004 and, in Div. 3P amounted to just 13 t from 2011-13. Reported landings from bottom trawls and gillnets became negligible by 2004.

						As well, reported landings of wolffish in Canada's EEZ have primarily been associated with longline fisheries, and have since become negligible. **Leatherback turtle:** It is currently listed as 'endangered' under SARA. Incidental entanglement in fishing gear such as pelagic longlines, lines associated with pot gear and gillnets, buoys and anchor lines, and other ropes and cables pose a risk of entanglement to Leatherback Sea Turtles. Entangled turtles are at risk of serious injury, infection, necrosis or death. Entanglement can limit the Leatherback Turtle's ability to feed. One of the most important sources of information on Leatherback turtles-fisheries interactions is the observer program conducted by DFO in each region (Newfoundland, Gulf, Quebec and Maritimes) and SARA logbooks. From SARA logbooks, there have been no reported interactions with this fishery from the Newfoundland and Labrador, Gulf, and Maritimes regions. During 2005-2011, there were three reports (one in 2006 and two in 2008) from the Quebec Region. It meets the SG80a score for both areas and all gear types.
		2.3.2	Management		Pass (≥80)	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which are designed to be highly likely to achieve national and international requirements for the protection of ETP species. Once protected under SARA, ETP species are subject to recovery strategies and management plans. A mandatory SARA logbook must be completed and submitted to DFO as a condition of license. Training courses in release techniques have been provided to license

						holders. A recovery strategy detailing procedures for expeditious release of wolfish has been established, industry has been trained, reporting procedures of encounters are in place and research on release methods used are monitored to ensure a high level of survival. Under SARA, a recovery strategy has been implemented for the leatherback turtle. There is some evidence that the strategy is being implemented successfully. There is existing information that interactions are low for all gears within each area. Loggerhead, leatherback, and green turtles have been increasing in abundance in recent years (NMFS 2015).
		2.3.3	Information		Pass (≥80	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. Information is also sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species A mandatory SARA logbook must be completed and submitted to DFO as a condition of license. There is also an at sea monitoring program that monitors ETP species. Fisheries enforcement also occurs both at-sea and at the dock. Finally the information concerning the distribution of wolfish species and leatherback turtles in the region is sufficient to suggest the 2J3KL cod fishery is not a major threat to the recovery of wolfish species or leatherback turtles.
	Habitats	2.4.1	Outcome	N	Pass (≥80	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

						Benthic habitats have been well-studied in the Newfoundland and Labrador region and have been described in detail (Kenchington et al 2010, DFO 2013b, DFO 2015c). The majority of the deeper 2J3KL offshore area is made up of softer sediments including clay/silt and sand, with significant areas of glacial till. Mixed sand/gravel appears to predominate in the southern area of 3L and central 2J (Aldous 2011). The gear types involved in this fishery have generally low impact on the benthic ecology and although there may be local effects where fishing density is greatest, the area fished is quite small compared to the large scale of the entire 2J3KL area. The UoAs is highly unlikely to reduce structure and function of the Vulnerable Marine Ecosystem (VME) habitats to a point where there would be serious or irreversible harm. **VME** **Deep Sea Corals** Deep sea corals are typically found at depths greater than 50 meters on the continental shelf and slopes, in offshore canyons, and near seamounts. Many of these species form complex three dimensional structures that provide important habitat for many species of fish and invertebrates, enhancing local biodiversity. Because these corals are fragile and slow-growing, they are particularly vulnerable to disturbance from certain types of fishing gear. While the extent of deep sea coral habitat degradation has not been quantified in most areas, bottom tending fishing gear has been known to cause significant disturbance in many locations, and is considered to be the major threat to deep sea corals in areas where such fishing occurs.

						Effects of commercial fishing gear on deep-sea corals has been documented. Passive gear, such as pots or longlines, can affect localized area of corals. Coral mortality is markedly increased due to corals being crushed, buried and wounded by gear as it is dragged over the bottom (Fossa et al 2002). The degree of disturbance to the coral and seafloor ranges from lightly disturbed areas of overturned cobble with attached living coral, to complete stripping of the seafloor (Stone 2006). There have been different sets of measures to protect deep sea corals from fishing activities. For example: Designation of coral protection zones based on the discretionary authority. These zones could include, but are not limited to: • Large precautionary areas based on a freeze-the-footprint approach • Enhanced protections in areas known to or expected to contain high concentrations of corals The gear types involved in the 2J3KL cod fishery have generally low impact on the benthic ecology and although there may be local effects where fishing density is greatest, the area fished is quite small compared to the large scale of the region.
		2.4.2	Management		Pass (≥80)	There is a partial strategy for habitat management in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. In June 2013, amendments to the Fisheries Act were adopted. The Fisheries Protection Program and its Policy Statements (November 2013) support changes made to the Fisheries Act. The Fisheries Protection Policy Statement (FPPS) focuses on the management of

						impacts to fish resulting from habitats degradation or loss and alterations to fish passage and flow. Through the FPPS, DFO objectives are to provide consistent guidance through regulations, standards and directives, and to make regulatory decisions in a timely manner. In this way, proponents will have the necessary information and direction to avoid, mitigate and offset harmful impacts to fish and fish habitat so that they will meet the goal of this policy, and thereby comply with the fisheries protection provisions of the Act. The prohibition against serious harm to fish applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the Act prohibits serious harm to fish which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. In 2009, DFO published the Policy for Managing the Impact of Fishing on Sensitive Benthic Areas under the auspices of the Sustainable Fisheries Framework in response to the 2006 United Nations Resolution 61/105. The purpose of this policy is to help DFO manage fisheries to mitigate impacts of fishing on sensitive benthic habitats or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species. There is some evidence that the partial strategy is being implemented successfully. There has been progress within DFO on the implementation of EBSA/protected areas. Fifteen EBSAs were identified and delineated in the study area in Divisions 2GHJ+3KL: three in coastal areas (Nain Area, Lake Melville, and Gilbert Bay); seven in offshore areas (Outer Shelf Saglek Bank, Outer Shelf Nain Bank, Hopedale Saddle, Labrador Slope, Labrador

						Marginal Trough, Notre Dame Channel, and Orphan Spur); four spanning coastal and offshore areas (Northern Labrador, Hamilton Inlet, Grey Islands, and Fogo Shelf); and one transitory EBSA that encompasses the southern extent of pack ice. The static (i.e. spatially defined) EBSAs represent approximately 31% coverage within the study area. There are currently 2 MPAs: Gilbert Bay MPA Eastport MPA In addition Canada has plans to increase the proportion of Canada's marine and coastal areas that are protected – to five percent by 2017, and ten percent by 2020.
		2.4.3	Information	N	Pass (≥80)	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. Benthic habitats have been well studied and have been described in detail (DFO 2009, NAFO 2010a, NAFO 2010b, Kenchington et al 2010, DFO 2014b, DFO 2013a, b, DFO 2015c). Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear. The impacts of longline, gillnets and hook and line on habitats have been widely studied. The scale and intensity of this fishery is not likely to have major impacts SG80c requires the on-going collection of data sufficient to detect any increase in risk to the habitat. There is no monitoring of temporal changes in the habitat. This monitoring occurs on a NAFO

						Division/Annual basis through the collection benthic data during Research Vessel cruises.
	Ecosystem	2.5.1	Outcome	N	Pass (≥80)	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. There have been many changes to the Newfoundland and Labrador ecosystem over the past 30 years. Some of the changes include: • A major cooling of bottom waters occurred in the mid-1980s; • The index of zooplankton abundance was low in the 1990s when phytoplankton levels were high and the opposite pattern during the 1960s and early 1970s; • Major structural changes in the fish community – a number of groundfish species have declined while small pelagic species and commercially exploited invertebrate species have increased; • Reductions in the average body size of groundfish, with unexpectedly low improvements in condition and growth; and • Steadily increasing abundance of seals The current recovery of the cod stock indicates that the ecosystem may be able to move back towards its original state, although the continued slow pace of Cod stock rebuilding remains a major concern. Given the precautionary management of cod stocks in the region, it is considered that the current fishery is unlikely to disrupt the key issues underlying the ecosystem structure to the point where there would be serious or irreversible harm. The assessment team could not find any evidence to indicate that the

						fishery causes any disruption to the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem's main structure and function. There is a comprehensive assessment of the target species, and information is available to show the negligible impact on retained, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats. However, gaps in information on retained species bycatch, interactions with ETP species and observer coverage fishing effort have been identified for recreational fisheries
		2.5.2	Management	N	Pass (≥80)	There is a partial strategy for habitat management in place which takes into account available information and is expected to restrain impacts of the fishery on the ecosystem to achieve the Ecosystem Outcome 80 level of performance. Under the Oceans Act and the Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada, DFO is committed to the development of large-scale and local integrated management plans for all of Canada's oceans. This includes implementation by DFO of an Ecosystem Approach to management in all activities for which it has management responsibility. The governance, regulation and management of activities within and surrounding the Gulf are shared between a wide variety of government departments and agencies involved in, or with an interest in, the use and management of resources within its coastal, estuarine and marine environments. The process is intended to involve all stakeholders. There is a strategy in place that is being implemented and will continue to develop under new national policies.

						Canada has developed a Sustainable Fisheries Framework (SFF) which builds on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the management of its fisheries to ensure continued health and productivity while protecting biodiversity and fisheries habitat. The primary goal of the SFF is to ensure that Canada's fisheries are environmentally sustainable, while supporting economic prosperity. It is designed to foster a more rigorous, consistent, and transparent approach to decision making across all key fisheries in Canada. Overall, the SFF provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada. The original policies under the SFF include: (i) A Fishery Decision-Making Framework Incorporating the Precautionary Approach (PA Framework); (ii) Policy on bycatch; (iii) Managing Impacts of Fishing on Sensitive Benthic Areas; and, (iv) a Policy on New Fisheries for Forage Species. Integrated Fisheries Management Plans (IFMPs) and self-diagnostic tools are among the planning and monitoring tools developed to help implement sustainable use policies. Policy on Bycatch The goals of the policy are to promote conservation and improve accounting of bycatch and discards while minimizing the risk that bycatch and discard species could be seriously or irreparably harmed by fishing activities. Precautionary Approach Framework. The Framework requires rebuilding plans to be established when a stock has reached the 'Critical Zone', a state of high risk. A new tool – Rebuilding Plan Guidelines – will help fisheries managers develop

						plans for growing stocks out of a depleted state. Managing Impacts of Fishing on Sensitive Benthic Areas Building upon the Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas, introduced by DFO in 2009, the Department has developed an Ecological Risk Analysis Framework (ERAF) that assists in identifying and measuring the ecological risks and impacts of fishing on sensitive benthic areas. This tool and the policy on which it is based have been developed in recognition of the importance of sensitive benthic areas to overall aquatic ecosystem health. Its implementation will support healthy and productive oceans and better ensure fishing is conducted sustainably. DFO and Park Canada have a number of MPAs designated under the Ocean Act (1996), including several areas of interest that are at various stages of progress towards designation. There is some evidence that the measures comprising the partial strategy are being implemented successfully. For example, the following is a list of protected areas in the Newfoundland and Labrador Region where the fishing industry and academia have worked with DFO to define and select areas for protection: • Gilbert Bay MPA; • Eastport MPA. In addition Canada has plans to increase the increase the proportion of Canada's marine and coastal areas that are protected – to five percent by 2017, and ten percent by 2020. There have also been other initiatives:

					• DFO ecological risk assessment tool for the implementation of DFO sensitive Benthic Policy • DFO strategy for the conservation of corals and sponges for Eastern Canada There are still policies that have yet to be implemented such as the bycatch policy, and the management of benthic sensitive areas. In theory It could be said that measures are considered likely to work based on plausible argument and information from the fishery/ecosystem involved. Despite an ongoing focus on ecological research as part of Canada's efforts to implement an ecosystem approach to management, the Assessment Team could not find any concern indicating that the fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, retained, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.
	2.5.3	Information	N	Pass (≥80)	Information is adequate to broadly understand the key elements of the ecosystem. Marine ecosystem dynamics of the Newfoundland/Labrador region have been well studied, specifically groundfish population dynamics (Bundy et al 2000, 2001, NAFO 2012, 2011, Koen –Alonso 2013,

						Gaichas et al 2014, DFO 2015a, DFO 2015b). Furthermore, information is generally adequate to broadly understand the key issues of the ecosystem. Main impacts of fishing gear under assessment can be inferred from existing information, like target and incidental catch removals (through individual stock assessments, especially for key groundfish species), gear effects on habitat structure and any structural changes to key commercial fish populations. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail. Fisheries interactions with this ecosystem have been documented at several levels and are well known (Bundy et al 2000, 2001, NAFO 2012, 2011, Koen-Alonso 2013, Gaichas et al 2014, DFO 2015a, DFO 2015b) and continue to be monitored at DFO. Sufficient information is available on the impacts of the fishery on the target and incidental retained bycatch, discards, ETP species and habitats to allow the main consequences of the 3 units of assessments on the ecosystem to be inferred. Information is sufficient to support the development of strategies to manage ecosystem impacts. These were present in the Integrated Fisheries Management Plan (2013) and are expected to be considerably more advanced in the successor to the plan. All UoAs meet the SG80.
	Number of PIs less than 60:					0

UOC 2 Longline

2	Primary Species	2.1.1	Outcome	N	Pass with Condition (60-79)	**Main primary species are likely to be above the PRI** From Aldous 2011: Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main and minor primary species (>5% of the catch) in this fishery. There has been insufficient data provided to determine the status of the various bait primary species that are used for the 2J3KL cod stewardship fishery. Therefore this PI is scored 60-79 (pass with condition). The availability of sufficient detailed information on the various bait species will result in a higher score for this PI.
		2.1.2	Management		Pass with Condition (60-79)	**There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.** **The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ Species** **There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species**

						From Aldous 2011 Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main retained species (>5% of the catch) in this fishery. However, there has been insufficient data provided to determine the status of the various bait species that are used for the 2J3KL cod stewardship fishery. No information is available on how these primary species used as bait are managed. Depending on their stock status, a partial strategy might be needed. Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
		2.1.3	Information		Pass (≥80)	**Quantitative information is available and is adequate to assess, with a high degree of certainty, the impact of the UoA on main primary species with respect to status**. There is information on the quantities of retained species from the 2J3KL longline fishery for longline. The assessment Team considers that sufficient data is collected to detect any increase in risk level. There is retained species status using age composition of landings, size and age composition of the population, and trends in relative abundance derived from survey biomass indices. All groundfish species must be landed and recorded in a logbook supported by dockside monitoring and independent observer coverage.
	Secondary species	2.2.1	Outcome	N	Pass with Condition	**Main secondary species are likely to be above biologically based limits**

				(60-79)	No Main Secondary Species have been found on longline gear. However, there has been insufficient data provided to determine the status of the various bait secondary species that are used for the 2J3KL cod stewardship longline fishery. No information is available on how these species used as bait are managed. Depending on their stock status, a partial strategy might be needed. Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
	2.2.2	Management		Pass with Condition (60-79)	**There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.** No Main Secondary Species have been found on longline gear. However, there has been insufficient data provided to determine the status of the various bait secondary species that are used for the 2J3KL cod stewardship fishery. No information is available on how these secondary species used as bait are managed. Depending on their stock status, a partial strategy might be needed. Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
	2.2.3	Information		Pass with Condition (60-79)	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. Information is adequate to support measures to manage main secondary species.

					Catch and discard data in the fishery are collected by on board by fisheries observers, Landings and effort data are recorded by DFO based on port sampling and vessel logbooks However the observer coverage is very low (0.8%). Due that the observer coverage is very low, it is difficult to say that there is some quantitative information available and adequate to assess the impact of the UoA on the main secondary species with respect to status.
ETP species	2.3.1	Outcome	N	Pass (≥80	**The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.** Please see UoA1 for detailed information
	2.3.2	Management		Pass (≥80)	**There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which are designed to be highly likely to achieve national and international requirements for the protection of ETP species.** Please see UoA1 for detailed information
	2.3.3	Information		Pass (≥80	**Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. Information is also sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species** Please see UoA1 for detailed information
Habitats	2.4.1	Outcome	N	Pass (≥80	**The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.** Please see UoA1 for detailed information
	2.4.2	Management		Pass (≥80)	**There is a partial strategy for habitat management in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above**. Please see UoA1 for detailed information

		2.4.3	Information	N	Pass (≥80)	**The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA**. Please see UoA1 for detailed information
	Ecosystem	2.5.1	Outcome	N	Pass (≥80)	**The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm**. Please see UoA1 for detailed information
		2.5.2	Management	N	Pass (≥80)	**There is a partial strategy for habitat management in place which takes into account available information and is expected to restrain impacts of the fishery on the ecosystem to achieve the Ecosystem Outcome 80 level of performance.** Please see UoA1 for detailed information .
		2.5.3	Information	N	Pass (≥80)	**Information is adequate to broadly understand the key elements of the ecosystem**. Please see UoA1 for detailed information
	Number of PIs less than 60:					0

UoC3 Handline

2	Primary Species	2.1.1	Outcome	N	Pass with Condition (60-79)	**Main primary species are likely to be above the PRI** From Aldous 2011: Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main and minor primary species (>5% of the catch) in this fishery. There has been insufficient data provided to determine the status of the various bait primary species that are used for the 2J3KL cod stewardship handline fishery. Therefore this PI is scored 60-79 (pass with condition). The availability of sufficient detailed information on the various bait species will result in a higher score for this PI.
		2.1.2	Management		Pass with Condition (60-79)	**There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.** **The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/** **Species**

						There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species From Aldous 2011 Available data from Stewardship/commercial fishery logbook records and observer reports indicate there are no main retained species (>5% of the catch) in this fishery. However, there has been insufficient data provided to determine the status of the various bait species that are used for the 2J3KL cod stewardship handline fishery. No information is available on how these primary species used as bait are managed. Depending on their stock status, a partial strategy might be needed. Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
		2.1.3	Information		Pass (≥80)	**Quantitative information is available and is adequate to assess, with a high degree of certainty, the impact of the UoA on main primary species with respect to status**. There is information on the quantities of retained species from the 2J3KL fishery for the major gears (gillnets, longline) and to somewhat extent to handline. The assessment Team considers that sufficient data is collected to detect any increase in risk level. There is retained species status using age composition of landings, size and age composition of the population, and trends in relative abundance derived from survey biomass indices. All groundfish species must be landed and recorded in a logbook supported by dockside monitoring and independent observer coverage.

						However there is insufficient quantitiative information on recreational handline fisheries for both areas. Data on retained species from the recreational hand line fisheries are not detailed enough. However, since there are no main retained species, SG80 scoring issue will probably be met
	Secondary species	2.2.1	Outcome	N	Pass with Condition (60-79)	**Main secondary species are likely to be above biologically based limits** No Main Secondary Species have been found on handline gear. However, there has been insufficient data provided to determine the status of the various bait secondary species that are used for the 2J3KL cod stewardship fishery. No information is available on how these secondary species used as bait are managed. Depending on their stock status, a partial strategy might be needed. Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
		2.2.2	Management		Pass with Condition (60-79)	**There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.** No Main Secondary Species have been found on handline gear. However, there has been insufficient data provided to determine the status of the various secondary bait species that are used for the 2J3KL cod stewardship handline fishery. No information is available on how these secondary species used as bait are managed. Depending on their stock status, a partial strategy might be needed.

					Thus it cannot be said the partial strategy/strategy is being implemented successfully and is achieving its overall objective. Therefore, this PI is scored 60-79 (pass with condition).
	2.2.3	Information		Pass with Condition (60-79)	**Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. Information is adequate to support measures to manage main secondary species.** Catch and discard data in the fishery are collected by on board by fisheries observers, Landings and effort data are recorded by DFO based on port sampling and vessel logbooks However the observer coverage is very low (0.8%). Due that the observer coverage is very low, it is difficult to say that there is some quantitative information available and adequate to assess the impact of the UoA on the main secondary species with respect to status.
ETP species	2.3.1	Outcome	N	Pass (≥80	**The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.** . Please see UoA1 for detailed information
	2.3.2	Management		Pass (≥80)	**There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which are designed to be highly likely to achieve national and international requirements for the protection of ETP species.** Please see UoA1 for detailed information
	2.3.3	Information		Pass (≥80	**Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. Information is also sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species** Please see UoA1 for detailed information

Habitats	2.4.1	Outcome	N	Pass (≥80	**The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.** . Please see UoA1 for detailed information
	2.4.2	Management		Pass (≥80)	**There is a partial strategy for habitat management in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above**. **There is some evidence that the partial strategy is being implemented successfully**. Please see UoA1 for detailed information
	2.4.3	Information	N	Pass (≥80)	**The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.** . **Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.** Please see UoA1 for detailed information

	Ecosystem	2.5.1	Outcome	N	Pass (≥80)	**The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm**. Please see UoA1 for detailed information
		2.5.2	Management	N	Pass (≥80)	**There is a partial strategy for habitat management in place which takes into account available information and is expected to restrain impacts of the fishery on the ecosystem to achieve the Ecosystem Outcome 80 level of performance.** Please see UoA1 for detailed information
		2.5.3	Information	N	Pass (≥80)	**Information is adequate to broadly understand the key elements of the ecosystem.** Please see UoA1 for detailed information .
	Number of PIs less than 60:					0

Principle 3. Scores are for all UoAs combined

3	Governance & policy			N	Pass (≥80)	The Fisheries Act is the main piece of legislation used to provide the basis for management of fisheries. The three fundamental subject matters dealt with in this legislation are the proper management and control of the fisheries, the conservation and protection of fish, and the protection of fish habitat and prevention of pollution. The two principal provisions used to manage and control fisheries are the Minister's licensing power under section 7 and the federal cabinet's regulation-making power under section 43. The first of these provisions allows for the inclusion of conditions on individual fishery licences to ensure proper management and control of specific

		3.1.1	Legal and customary framework			fisheries. Case law suggests that if the Minister stays within the framework of the Act and applies the principles of administrative law in making decisions with respect to licensing, he or she is not subject to challenge before the courts. The primary regulations used to control commercial east coast fisheries are the *Atlantic Fishery Regulations, 1985.* There is a small portion of the 2J3KL area outside the Canadian EEZ. In this case the NAFO Convention and the NAFO Conservation and Enforcement Measures are used to management fisheries. NAFO is a well-established Regional Fisheries Management Organization that has been in place since the late 1970's. There is an agreement between Canada and NAFO related to the management of 2J3KL cod. The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective (Canadian courts and the NAFO Convention Dispute settlement procedures). In the 2J3KL area there is a land claim that outlines the fishing rights of the Inuit of Labrador - this claim has been negotiated between the Inuit and both the Canadian and Newfoundland & Labrador Governments. Other Aboriginal groups are currently provided opportunity for fishery access for FSC (food, social and ceremonial) purposes. Given the above this PI has a score of ≥80 (Pass).
					Pass (≥80)	DFO implemented a formal Consultation Policy in 2004 (http://www.dfo-mpo.gc.ca/Library /282187.pdf). This policy indicates DFO's commitment to improved consultations. The

		3.1.2	Consultation, roles and responsibilities	N		principles outline common approaches to consultations within DFO and with stakeholders. It should be noted, however, consulting with Aboriginal groups involves special considerations and those considerations are described in separately in this policy document. There are many specific references to various governance and consultation processes for 2J3KL cod throughout the DFO literature posted on its website. The Governance Section of the 2J3KL Groundfish Management Plan published in 2013 describes how consultation occurs: "Groundfish management is conducted through advisory processes. The advisory committee solicits the opinions of stakeholders on past management practices and focuses on management measure recommendations for future groundfish fisheries. This includes recommendations on the Total Allowable Catch (TAC)." (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/groundfish-poisson-fond/groundfish-poisson-fond-div2-3KL-eng.htm). The management decisions for 2J3KL cod also described that additional consultation with industry participants is required to finalize additional management measures (e.g. Seasons). The consultation process provides opportunity for all interested and affected parties to be involved, therefore the score for this PI is Pass (≥80).
						A general long-term objective for Fisheries and Oceans Canada in described in broad terms (http://www.dfo-mpo.gc.ca/oceans/oceans-eng.htm): "DFO strives to safeguard Canada's healthy and productive aquatic ecosystems and thus helps to maintain sustainable resources for Canadians by adopting an integrative approach for improved management and conservation of our oceans." DFO also articulates that its Long-term objectives for sustainable

		3.1.3	Long term objectives	N	Pass (≥80)	fisheries need to address (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/guidance-guide/template-app-a-ann-modele-eng.htm#n3.5): Stock Conservation, the Ecosystem, Stewardship, Social, cultural, and economic (i.e. commercial, recreational, Aboriginal) and compliance. DFO's Guidance documents indicate that Integrated Fishery Management Plans will incorporate limit reference points developed within the framework of the precautionary approach, as well as associated decision rules. The above suggests that there are clear long term objectives consistent with MSC Fisheries Standard and the precautionary approach, which are explicit within management policy. Therefore the score for this PI is Pass (≥80).
	Fishery specific management system	3.2.1	Fishery specific objectives	N	Pass (≥80)	Overall goals of the Newfoundland Groundfish IFMP: Consistent with the requirements of the Sustainable Fisheries Framework and other applicable laws to develop sustainable fishery management plans to research and manage the groundfish fishery at long-term sustainable levels (P1). Some of IFMP objectives address P2 issues such as bycatch, management/protection of ETP etc. The 2J3KL cod stock is currently below the defined biomass limit reference point (LRP) determined in 2010. There has been some growth in this stock during the recent period with the Spawning Stock Biomass average of the past 3 year at 26% of the LRP. Annual fisheries specific objectives are simply to maintain removals at the lowest possible level while allowing the spawning stock to rebuild to a healthy level.

						Short and long term objectives (above), are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, and are explicit within the 2J3KL Cod management system. Therefore the score on this PI is Pass (≥80).
		3.2.2	Decision making processes	N	Pass (≥80)	The following are decision making processes that result in measures and strategies to achieve the fishery-specific objectives for 2J3KL cod. Groundfish management is conducted by DFO through advisory processes. The advisory committee solicits the opinions of stakeholders on past management practices and focuses on management measure recommendations for future groundfish fisheries. This includes recommendations on the removals from the fishery. Ministerial approval of TACs is required while approval of the "Evergreen" Integrated Fisheries Management Plan (IFMP) for Groundfish in 2J3KL (including 2J3KL cod) is the responsibility of the Regional Director, Fisheries Management, Newfoundland and Labrador Region. Recommendations from all stakeholder groups on TACs and all management measures are considered in the development of the IFMP. Decision making for opening and closing dates in specific areas and gear types is done in consultation with industry as well as DFO Area Staff. Other issues that arise during the lifetime of this plan are addressed through similar consultative processes. The stock assessment and associated management approach is based on the LRP determined and the maintaining the catch for this stock at the lowest possible level. Information on the management of the fishery is regularly reviewed between discussions and consultations between government officials

					and industry stakeholders, other levels of government, academics and from time to time the general public. The Government of Canada is responsive to questions related to the science and management of the 2J3KL cod stock as well as other fish stocks. Given the above the score for this PI is ≥80 (Pass).
		3.2.3	Compliance and enforcement	N	Pass (≥80)	A comprehensive monitoring, control and surveillance system has been implemented in the 2J3KL cod fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. The stewardship fishery is monitored using observers, dockside monitoring and Fishery Officers while the recreational fishery is monitored solely by Fishery Officers. Dockside monitoring for the stewardship fishery in 2J3KL is conducted approximately 1/3 of all landing sites ports at a rate of 100% coverage, while the remaining ports receive random monitoring. During the past 3 years DFO has expended approximately 5000 patrol hours annually monitoring the stewardship and recreational fisheries. This is in addition to dockside monitoring and at-sea observer coverage.

		3.2.4	Management performance evaluation	N	Pass (≥80)	All parts of the management system are subject to public evaluation through meetings of DFO personnel and related science and management committees. Performance of the fishery is evaluated at annual stock assessment meetings and revised CHP's respond to the needs of management. DFO conducts Post-season analyses for all fisheries on an annual basis. The 2015 post analysis occurred on January 14-15, 2016 at the Northwest Fisheries Atlantic Fishery in St. John's. The House of Commons Standing Committee on Fisheries also provides an occasional external review of fisheries issues.
	Number of PIs less than 60:					0

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