



Marine Stewardship Council Assessment

Final Report and Determination

For the

Groundfish Enterprise Allocation Council (GEAC)

Canada 3LN Redfish Fishery

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Glossary

AFR	Atlantic Fishery Regulations
AFS	Aboriginal Fisheries Strategy
B_{lim}	Stock size below which the recruitment would be impaired
B_{MSY}	Stock size that can produce maximum sustainable yield when it is fished at a level equal to F_{MSY}
CAB	Conformity Assessment Body
C&P	Conservation and Protection (DFO Enforcement Unit)
CoC	Chain of Custody
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch per Unit Effort
CR	Certification Requirements
CSAS	Canadian Science Advisory Secretariat
DFO	Department of Fisheries and Oceans Canada
DMP	Dockside Monitoring Program
EAM	Ecosystem Approach Management
EEZ	Exclusive Economic Zone
ESBA	Ecologically and Biologically Significant Areas
ETP	Endangered, Threatened and Protected species
F	Fishing Mortality Rate
F_{lim}	Fishing mortality rate that causes a stock to fall below B_{lim}
F_{MSY}	Fishing mortality rate at the level that would produce maximum sustainable yield from a stock that has size of B_{MSY}
FAO	United Nations Food and Agriculture Organization
GEAC	Groundfish Enterprise Allocation Council
IFMP	Integrated Fisheries Management Plan
IPI	Inseparable or Practically Inseparable stock(s)
HCR	Harvest Control Rule
LCH	Laurentian Channel
LRP	Limit Reference Point
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSE	Management strategy evaluation
MSY	Maximum Sustainable Yield, it is the largest average catch that can be continuously taken from a stock under existing environmental conditions
NAFO	North Atlantic Fisheries Organization
PA	Precautionary Approach
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PI	MSC Performance Indicator
RAP	Regional Advisory Process
SAR	Science Advisory Report
SARA	<i>Species At Risk Act</i>

SFF	Sustainable Fisheries Framework
SG	Scoring Guidepost
SSB	Spawning stock biomass
UoC	Unit of Certification
VME	Vulnerable marine ecosystem

1. MSC Fishery Assessment Report

Fishery Unit	This assessment report under the 'Unit of Certification' (UoC) covers the Acadian redfish stock and two methods of capture and the resulting scores are for bottom and mid-water trawl landings by registered licence holders. Fishing for these UoCs is within and outside the Canadian Exclusive Economic Zone (EEZ) and exclusively in North Atlantic Fisheries Organization (NAFO) divisions 3LN.	
Report Issue	October 2016	• Client Report
	Re-issued November 2016	
	9 th December 2016	• Peer Review
	28 th February 2017	• Public Comment Draft Report
	X 20th April 2017	• Final Report and Determination
		• Public Certification Report
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The aim of this assessment is to determine the degree of compliance of the fishery with the Marine Stewardship Council's (MSC) Principles and Criteria for Sustainable Fishing.

This Final Report and determination is written for the stakeholders after the site visit, scoring, client review, peer review, stakeholders consultation on the PCDR, and contains:

- The MSC Standard and Certification Requirements (CR) used, MSC Fishery Standard - Principles and Criteria for Sustainable Fishing v1.1 and the MSC CR v1.3
- The scores, weighting and certification outcome (Section 6)
- All intended conditions and the client action plan in Appendix 1.3

'Conditions provide for agreed further improvement in the fishery and provide one of the bases for subsequent audit. They are intended to improve performance against the MSC Principles'.

- The assessment team certification recommendation
- The peer reviewers 'comments and the assessment team's responses in Appendix 2
- The stakeholders' submissions and the assessment team's responses in Appendix 3
- The assessment followed the current versions of MSC scheme requirements and these were implemented by SAI Global accredited MSC Procedures.
- Information sources used are provided throughout the report and full references for published, unpublished data and main websites accessed are documented at the end of this report in the reference section.

2. Executive Summary

This report sets out the details of the MSC assessment for the Canada 3LN redfish (*Sebastes fasciatus*) Fishery against the MSC Principles and Criteria for Sustainable Fisheries. The report details the background, results and justification of the fishery, carried out by SAI Global.

The assessment process began in March 2015. As a requirement of the assessment process (CR 27.9.1), the site visit announcement was advertised in the following local newspaper, *The Telegram*, as it was felt this was the most appropriate publication for this fishery.

The MSC Guidelines to Conformity Assessment Body (CAB) specify that the Unit of Certification (UoC) is “The fisheries or fish stock (biologically distinct unit) combined with the fishing method/gear and practice (vessel(s) pursuing the fish of that stock) and management framework”. Accordingly, the Canada 3LN redfish fishery proposed for certification is defined according to the 2 UoCs:

UoC 1 Bottom trawl

Species	<i>Sebastes fasciatus</i> , Acadian redfish
Geographical Area	NAFO Divisions 3LN (within and outside Canada EEZ)
Stock	Acadian redfish stock in Div. 3LN
Method of capture	Bottom trawl
Management system	NAFO / Department of Fisheries and Oceans (DFO) Newfoundland and Labrador Region
Client Group	Groundfish Enterprise Allocation Council (GEAC)

UoC 2 Mid-water trawl

Species	<i>Sebastes fasciatus</i> , Acadian redfish
Geographical Area	NAFO Divisions 3LN (within and outside Canada EEZ)
Stock	Acadian redfish stock in Div. 3LN
Method of capture	Mid-water trawl
Management system	NAFO / Department of Fisheries and Oceans (DFO) Newfoundland and Labrador Region
Client Group	Groundfish Enterprise Allocation Council (GEAC)

This fishery has not previously been assessed against the MSC Principles and Criteria for Sustainable Fishing under any other previous certificate. The current assessment requires taking into account other assessments led by a CAB to ensure consistency of assessment outcomes as there are MSC certified fisheries that overlap at present (See Section 5.1).

The assessment covers NAFO Divisions 3LN and its Canadian licence holders. A full and up to date active list of fishing vessels was made available by the client group and will be provided to the SAI Global on an annual basis as a requirement of surveillance conditions. It is to be interpreted in strict accordance with operational practices, including adherence to the certificate sharing mechanism defined in CR 27.23.1. The Client Sharing Letter can be seen at:

https://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/canada-3ln-redfish/assessment-downloads-1/20150331_CERT_SHARE_RED525.pdf

2.1 Canada 3LN redfish fishery key strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> ● The Acadian redfish stock is healthy ● Very low level of non-target catches ● Very low interactions with ETP species ● The fishery is highly unlikely to disrupt key elements underlying ecosystem structure and function ● Robust governance and policy ● Robust consultation process 	<ul style="list-style-type: none"> ● Redfish species were not monitored separately until very recently ● Fishery-specific objectives expressed by MSC's Principle 2 are not explicit within the fishery's management system

2.2 Assessment Results

A rigorous assessment against the MSC Principles and Criteria was undertaken by the assessment team and detailed, fully referenced scoring rationale is provided in Appendix 1 of this report.

Both UoCs achieved the minimum required score of 80 or above on each of the three MSC Principles independently and did not score less than 60 against any Performance Indicator (PI).

Final Principles scores are shown in the table below.

UoC 1 Bottom trawl

Principle	Score	PASS/FAIL
Principle 1 – Target Species	93.1	PASS
Principle 2 – Ecosystem	83.3	PASS*
Principle 3 – Management System	83.1	PASS*

UoC 2 Mid-water trawl

Principle	Score	PASS/FAIL
Principle 1 – Target Species	93.1	PASS
Principle 2 – Ecosystem	88	PASS*
Principle 3 – Management System	83.1	PASS*

*Although the assessment team found the overall Principle and Units of Certification in overall compliance with MSC Standard, it also found the performance of two performance indicators (PI 2.1.3 and PI 3.2.1) to be below the established compliance mark (Score of 80) for both UoCs. Full explanation of these conditions is provided in Appendix 1.3.

2.3 Conditions and Recommendation for continued certification Conditions (both UoCs)

Two PIs which contribute to the overall assessment score were assessed as scoring less than the unconditional pass mark, and therefore two conditions were attached to the fishery, which must be addressed within a specified timeframe. The condition is applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification. A full explanation of how the Client intends to meet these conditions is provided in the client action plan in Appendix 1.3 of the report. As a standard requirement of the MSC CR, the fishery shall be subject to (as a minimum) annual surveillance audits. These audits shall be publicised and reports made publicly available.

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/A)
1	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk level to deep-water redfish.	2.1.3	NA
2	The client must provide documented evidence that short and long-term objectives for the 3LN Redfish fishery have been adopted which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system.	3.2.1	NA

Recommendation

A recommendation is not obligatory and does not require a client action plan as for a condition. It means that it does not have to be implemented to maintain the certification. But the client is encouraged to act upon within the spirit of the MSC certification. The assessment team made two recommendations.

Recommendation 1 (UoC 2)

The assessment team recommends that the client provides up-to-date target species, retained and bycatch species catches and ETP species information if the mid-water trawl starts to be used again.

Recommendation 2 (for both UoCs)

A species-specific sampling of redfish has been recently added in the DFO trawl surveys (Autumn 2015). The assessment team recommends that analytical effort now be directed to using these data to monitor trends of each redfish species to help ensure that managing to the level of complex does not place the individual redfish species at risk.

2.4 Certification Recommendation

On completion of the assessment and scoring process, the assessment team has recommended that the Canada 3LN redfish fishery is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing.

2.5 Assessment Process

The assessment followed set procedures as described in the MSC CR v1.3. Key stages of the assessment were:

- **Stage 1: Fishery Announcement and Assessment Team Formation**
 - Stakeholder Notification: Fishery enters full assessment – 31st March 2015
 - Stakeholder Notification: Assessment team nominated – 31st March 2015
 - Stakeholder Notification: Assessment team confirmation - 14th April 2015
- **Stage 2: Building the Assessment Tree**
 - Stakeholder Notification: Use of the default assessment tree with Principle 1 modifications – 28th May 2015
- **Stage 3: Information gathering, stakeholder meetings and scoring**
 - Stakeholder Notification: Site Visit scheduled – 28th May 2015

- **Stage 4: Client and peer review**
 - Stakeholder Notification: Revised timeline– 13th August 2015, 8th December 2015
 - Stakeholder Notification: Variation request for Change in UoC, Change in Assessment tree and Consider *S. mentella* as an IPI stock; additional stakeholder consultation period – June 2016
 - Stakeholder Notification: proposed peer reviewers – 6th September 2016
 - Stakeholder Notification: Revised timeline – 17th November 2016
 - Stakeholder Notification: Variation Request – 13th December 2016
- **Stage 5: Public review of the draft assessment report**
 - Stakeholder Notification: Public Comment Draft Report issued – 28th February 2017

3. Authorship and Peer Reviewers

3.1 Assessment team

Géraldine Criquet (Lead Assessor, Responsibilities on Principle 2)

Géraldine manages technical functions of SAI Global’s MSC Fishery Program and is an approved MSC Fishery Team Leader. Géraldine holds a PhD in Marine Ecology (École Pratique des Hautes Études, France) which focused on coral reef fisheries management, Marine Protected Areas and fish ecology. She has also been involved during 2 years in stock assessments of pelagic resources in the Biscay Gulf, collaborating with IFREMER. She worked 2 years for the Institut de Recherche pour le Développement (IRD) at Reunion Island for studying fish target species growth and connectivity between fish populations in the Indian Ocean using otolith analysis. She served as Consultant for FAO on a Mediterranean Fisheries Program (COPEMED) and developed and implemented during 2 years a monitoring program of catches and fishing effort in the Marine Natural Reserve of Cerbère-Banyuls (France). Geraldine joined SAI Global in August 2012 as Fisheries Assessment Officer and is involved in FAO RFM and MSC fisheries assessments.

Rick Stanley (Assessor, Responsibilities on Principle 1)

Rick received a M.Sc. in Zoology from the University of British Columbia in 1977. Following work on overseas fisheries projects in Indonesia (1978) and El Salvador (1979), he worked for the Department of Fisheries and Oceans Canada (DFO) as a research biologist at the Pacific Biological Station in Nanaimo Canada until August 2013. During those years with DFO, he was senior author or co-author of 19 peer-reviewed stock assessments on British Columbia populations of various species of rockfishes (*Sebastes spp.*). He also served on the working groups and review committees of assessment on many other species of groundfish and invertebrates. In addition to stock assessment activity, he has published primary papers on the general biology of rockfishes including papers on ageing, parasites and reproductive biology, as well acoustic biomass estimation. An additional focus of Mr. Stanley’s work at DFO was the development of fishery catch monitoring programs and bottom trawl surveys for groundfish. Following his retirement from DFO in August 2013, Mr. Stanley began work as a self-employed fisheries consultant.

Eric Dunne (Assessor, Responsibilities on Principle 3)

Eric has over 45 years’ experience in the economic, policy and operations analyses and executive management of the full range of fishery management activities and functions. Since 1995, he has been a fishery consultant based in St. John’s, Newfoundland, Canada, specializing in comprehensive analysis of all aspects of fisheries management activities and issues. With an educational background in the economics of fishing, he had previously held senior positions in the Department’s economics and policy development functions. He later gained experience in the area of fisheries innovation and technology development. As well, he has lectured on fisheries management and fisheries economics

in the Masters of Marine Studies Program at Memorial University of Newfoundland and Labrador. Most recently he has become fully versed in the overall MSC assessment process. In this context, he has assessed all aspects of the management systems utilised for a variety of finfish and shellfish fisheries from the sub-Arctic areas of the Northwest Atlantic to the Gulf of Mexico.

3.2 Peer Reviewers

Mr Don Aldous

Don Aldous has been involved in fisheries management issues in Canada and the Pacific Islands since 1977. He has experience at all levels of fisheries management from Fishery Officer to Commissioner of a Regional Fisheries Management Organization. In Canada, he achieved a Senior Advisor position in matters dealing with foreign and domestic fisheries management. He led teams of consultants preparing fisheries management plans for Fiji, Solomon Islands and Marshall Islands and has returned to conduct follow-up work in all three. On a regional scale, he has provided advice to FFA on issues related to fisheries management, development and MCS. Don is considered a P3 expert for Marine Stewardship Council (MSC) assessments and has been involved as an Associate Auditor since 2009 as an editor, project coordinator, P3 expert and team leader.

Mr William B. Brodie

William (Bill) Brodie graduated from Memorial University of Newfoundland with a BSc. in biology in 1978, and then worked as a fisheries biologist. After a 36-year career with Fisheries and Oceans Canada (DFO), he retired from there in 2014, and has since been doing some fisheries consulting. His main areas of work have included flatfish biology, trawl surveys, and stock assessment, involving various species and several international fisheries in the Newfoundland and Grand Banks regions. Mainly through his extensive involvement with the Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO), Bill participated in and chaired many scientific committees dealing with fishery advice, as well as ecosystem and precautionary approaches for numerous fish and shellfish stocks.

4. Description of the Fishery

4.1 Units of Certification and scope of certification sought

The MSC Guidelines to Conformity Assessment Body (CAB) specify that the Unit of Certification (UoC) is “The fisheries or fish stock (biologically distinct unit) combined with the fishing method/gear and practice (vessel(s) pursuing the fish of that stock) and management framework”. Accordingly, the Canada 3LN redfish fishery proposed for certification is defined according the 2 UoCs:

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UoC 2 Mid-water trawl

Species	<i>Sebastes fasciatus</i> , Acadian redfish
Geographical Area	NAFO Divisions 3LN (within and outside Canada EEZ)
Stock	Acadian redfish stock in Div. 3LN
Method of capture	Mid-water trawl
Management system	NAFO / Department of Fisheries and Oceans (DFO) Newfoundland and Labrador Region
Client Group	Groundfish Enterprise Allocation Council (GEAC)

4.1.1 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; and
- There are catches of non-target stocks that are inseparable or practicably inseparable (IPI) from the target stock. There are two species of redfish in Division 3LN, the deep-water redfish (*S. mentella*) and the Acadian redfish which have very similar external characteristics making them difficult to distinguish. Both species are fished as a stock complex, and catches are reported collectively. Therefore *S. mentella* is identified as IPI catches. The catches of *S. mentella* fulfil the requirements of MSC CR 27.4.9.1:
 - a. the retained catch is indistinguishable during normal fishing operations. The two redfish species have very similar external characteristics making them extremely difficult to distinguish.
 - c. the total catches of *S. mentella* do not exceed 15% by weight of the total combined catches of redfish within the units of certification in the most recent annual fishing year. The conclusion of the fall 2015 DFO survey and the analysis of samples taken on-board fishing vessels is that the majority of the redfish biomass and the majority of the commercial fishery is comprised of *S. fasciatus*, and *S.mentella* comprises less than 10% of the catches.
 - d. Redfish are not ETP species.
 - e. *S. mentella* is not certified separately.

Fish and fish products coming from *S. mentella* are allowed to enter into chains of custody (A27.4.10) and the requirements for IPI stocks in Annex CH apply for *S. mentella*.

4.1.2 Eligible fishers

Although there are no other Canadian trawl vessels outside the client group engaged in fishing for redfish in NAFO Divisions 3LN, there are non-Canadian trawl vessels targeting redfish in NAFO Div. 3LN. Redfish catches by other nations are presented in Table 4.

4.1.3 Scope of Assessment in Relation to Enhanced Fisheries

The fishery under assessment is not an enhanced fishery.

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

The fishery under assessment is not an Introduced Species Based Fishery.

4.2. Overview of the fishery

4.2.1. Biology of the *S. fasciatus*

Taxonomy and geographic range



Figure 1. *Sebastes fasciatus* (Storer, 1856). Source: FAO species fact sheet¹.

The Acadian redfish, also known as the Atlantic redfish, is marine deep-water fish belonging to the family of Sebastidae. The Northwest Atlantic redfish consists of a complex of three species identified as *Sebastes fasciatus*, *S. mentella*, and *S. marinus*, the last two occurring at much lower abundance. Their external characteristics are very similar, making them difficult to distinguish. The redfish distribution ranges from the Gulf of Maine, northwards off Nova Scotia and southern Newfoundland Banks, in the Gulf of St. Lawrence and along the continental slope and deep channels from the southwestern Grand Bank to areas as far north as Baffin Island. Redfish are also present in the area of Flemish Cap and west of Greenland.

¹ <http://www.fao.org/fishery/species/2525/en>

Habitat

Redfish inhabit deep cool waters throughout the Atlantic (3-8°C) along the slopes of fishing banks and deep channels. Redfish species are bentopelagic and show differential ecological preferences. *S. fasciatus* typically occurs in depths from 70 to 500 m.

Stock structure

Redfish species are currently managed under nine management areas in the Northwest Atlantic (Figure 2). They are based on NAFO Divisions: West Greenland (Subarea 1), Labrador Shelf (2GHJ-3K), Flemish Cap (3M), North and East Grand Banks (3LN), South Western Grand Bank (3O), Gulf of St. Lawrence (Unit 1 consisting of 4RST, 3Pn4Vn) Laurentian Channel (Unit 2 consisting of 3Ps4Vs4Wfgj, 3Pn4Vn), Scotian Shelf (Unit 3 consisting of 4WdehklX) and Gulf of Maine (Subarea 5).

The overall population structure of redfish is complex.

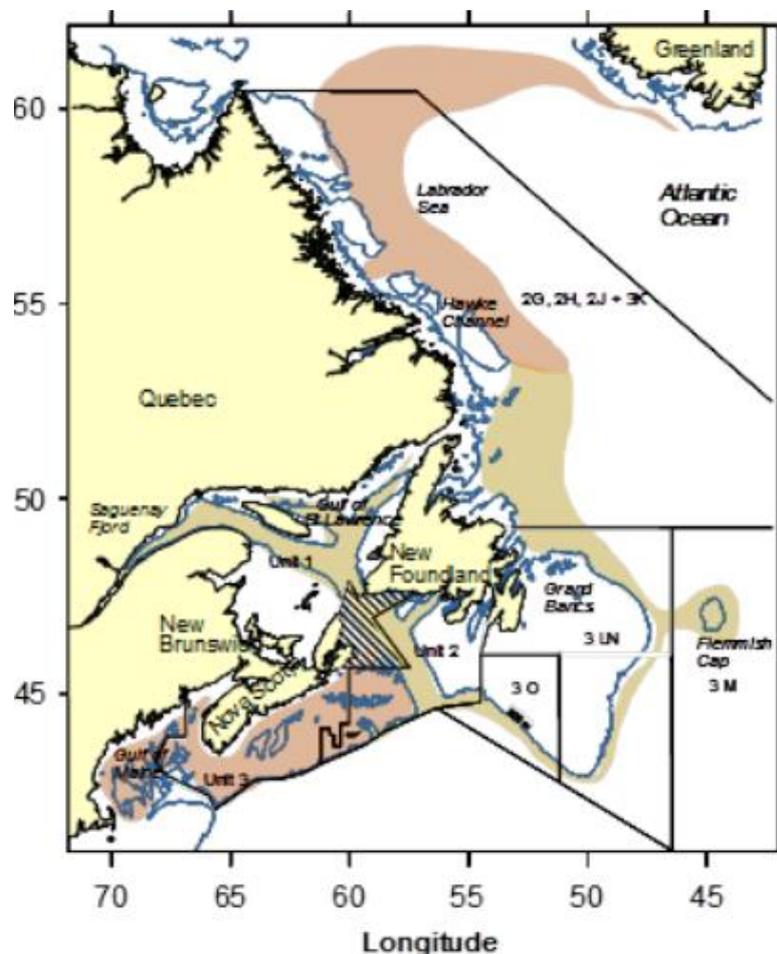


Figure 2. Map of the northwest Atlantic showing the distribution of redfish and boundaries of the management units. Source: DFO 2011.

Maturity, Reproduction and early Life History (DFO 2011)

Males mature 1-2 years earlier than females of the same species and at a size that is 3-5 cm smaller than females.

Unlike many other marine coldwater fish species, redfishes are ovoviviparous. Fertilization is internal and females bear live young. Mating takes place in the fall between September and December and females carry the developing embryos until they are extruded as free swimming larvae (7 mm) in spring (April to July). Mating and larval extrusion do not necessarily occur in the same locations. Fecundity varies according to female size, from 1,500 to 107,000 larvae.

Redfish recruitment success varies significantly. With minor exploitation and low abundance conditions, significant year-classes may be observed at 5 to at least 12 year intervals. A stock-recruit relationship is not apparent in redfish stocks in the northwest Atlantic.

Growth and Age (DFO 2011)

Redfishes are slow-growing species with high longevity that can commonly live up to 40 years and exceptionally up to 75 years. The growth of *S. fasciatus* is not as rapid as that of *S. mentella*, although this difference in growth rates becomes apparent only after the age of 10 years. Females grow faster than males after the age of about 10 years. Growth is usually faster in areas further south. The maximum size attained is 45 cm (Gulf of Maine). On average, 6 to 8 years are needed to reach the minimum legal size of 22 cm.

Prey and predator (DFO 2011)

In the larval stage, redfish feed mainly on fish eggs and invertebrates. The larger larvae feed on copepods and euphausiids. Juvenile and adult individuals add to their diet: copepods, euphausiids and fish.

In the Gulf of St. Lawrence, harp seals and skates are important redfish predators. However, before its decline, cod was the main predator. On the Labrador Shelf, Greenland halibut and skate are the main predators of redfish. On the eastern Scotian Shelf, haddock, pollock and grey seals are important predators.

4.2.2. Fishing area

The Canada 3LN redfish fishery occurs in FAO Fishing Area 21 (Northwest Atlantic), NAFO Divisions 3L and 3N (Figure 3) inside and outside Canada EEZ.

Division 3L. That portion of the subarea lying between the Newfoundland coast from Cape Freels to Cape St Mary's and a line described as follows: beginning at Cape Freels; thence due east to the meridian of 46°30' west longitude, thence due south to the parallel of 46°00' north latitude; thence due west to the meridian of 54°30' west longitude, thence along a rhumb line to Cape St Mary, Newfoundland.

Division 3N. That portion of the subarea lying south of the parallel of 46°00' north latitude and between the meridian of 46°30' west longitude and the meridian of 51°00' west longitude

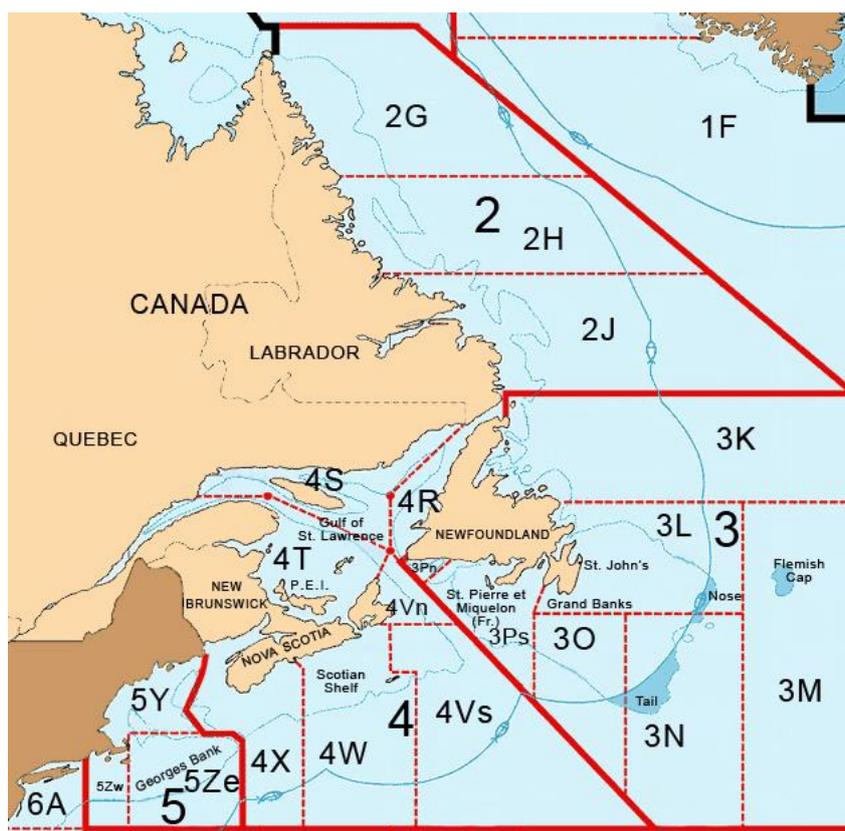


Figure 3. Map of NAFO Convention Area. Plain red line: boundary on Subareas; dotted red line: boundary of Divisions; plain light blue line with fish; 200 mile zone boundary. Source: NAFO².

4.2.3. History of the 3LN redfish fishery

Between 1959 and 1960 reported catches drop from 44,600 to 26,600 t, oscillating over the next 25 years (1960-1985) around an average level of 21,000 t. Catches rise afterwards to a 79,000 t high in 1987 and fall steadily to a 450 t minimum reached in 1996. Catches were kept at a low level since then (450-3 000 t) until 2009.

In the early 1980's the former USSR, Cuba and Canada were the primary fleets directing for redfish in Div. 3LN. The rapid expansion of the fishery was due to the entry of EU-Portugal in 1986 and South Korea in 1987, along with various re-flagged fleets. In the early 1990's Russia and the Baltic mid-water trawlers, together with South Korea and Portuguese bottom trawlers, were still responsible for the bulk of fishing effort. South Korea left the area by the end of 1993 and from 1994 onwards the other fleets reduced effort substantially on Div. 3LN. The quick decline of redfish catch rates was the main reason for this reduction of redfish fishing effort, and justified its partial shift southwest to Div. 3O.

Since 1994 most of the redfish catches in NAFO Divisions 3L and 3N were taken as by-catch of the Greenland halibut fishery pursued from the northern slopes of the Sackville Spur in Div. 3L through Flemish Pass till the canyons of southern Grand Bank in Div. 3N. EU-Portugal and EU-Spain bottom trawl fleets were the main fleets responsible for the 3LN redfish by-catch during the moratorium years. The NAFO Fisheries Commission implemented a moratorium on directed fishing for this stock in 1998. During the moratorium years, redfish from divisions 3L and 3N was primarily taken as by-catch in the Greenland halibut fishery pursued by EU-Portugal and EU-Spain. In June 2008 the Scientific Council

² <https://www.nafo.int/Portals/0/PDFs/GeneralInfo/NAFO-map-poster-8.5x11-web.pdf?ver=2016-07-26-112954-377>

recognized that there was enough evidence to allow a small amount of direct fishing in 2009 (not exceeding 3 500 t), taking into account the high biomass and very low fishing mortality indices observed. Despite this recommendation the Fisheries Commission decided to continue the ban on direct fishing in 2009 but allowed an increase to 10% redfish by-catch rate in other fisheries. In June 2009 the Scientific Council confirmed that the levels of catches have not altered the upward trend of the stock, as shown by spring and autumn surveys, and Fisheries Commission finally reopened the fishery with a TAC for 2010 of 3,500 t. The Fisheries Commission endorsed the Scientific Council recommendation from the 2010 analytical assessment and set the TAC for 2011 and 2012 at 6,000 t. Based on the main conclusions from the 2012 assessment Scientific Council recommended that fishing mortality in 2013 and 2014 should be kept around $F_{statusquo}$, but didn't specify a TAC. Fisheries Commission set the 2013-2014 TAC at 6,500 t, slightly above the average 2013-2014 projected catch at $F_{statusquo}$. Catches from EU Portugal, Russian and Canadian fleets justified most of the recent increase on the redfish catch observed on divisions 3L and 3N between 2010 and 2013.

4.2.4. TAC and Catches

Canada holds 42.6% of the redfish overall TAC for Div. 3LN. GEAC represents licence holders who have 96.99% of Canada's allocation.

Table 1. Overall TAC and quota allocated to Canada. The values listed include quantities to be taken inside and outside the 200-mile fishing zone.

	Overall TAC (t)	Canada's quota (t)	"GEAC's" allocation (t)
2012	6,000	2,556	2,479
2013	6,500	2,769	2,686
2014	7,000	2,982	2,892
2015	10,400	4,430	4,297

Table 2. "GEAC's" redfish catches in Div. 3LN by bottom trawl.

	2012	2013	2014	2015
GEAC catches (t)	1,213	2,428	1,443	4,443

The mid-water trawl is not currently used and has last been used before the moratorium. Redfish catches from vessels > 100' for the 1988-1999 period are shown in Table 3.

Table 3. Redfish catches in Div. 3LN by mid-water trawl.

	1988	1989	1990	1991	1992	1999
Catch (t)	2,426.6	883,5	0.4	-	535.3	4,896

4.2.5. Fishing season

Fishing activities take place from January 1 to December 31, at any time of the year.

4.2.6. Fleet description and fishing method

At the time of this report, three >100' vessels prosecute the 3LN redfish fishery under assessment: the Kinguk (gross tonnage 1,009 mt, length 47.7m), the Aqviq (gross tonnage 1,009 mt, length 47.7m) and Ocean Breaker (gross tonnage: 1,932 mt, length: 56.0m). The Kinguk and the Aqviq mainly target yellowtail flounder whereas the Ocean Breaker mainly targets redfish.

The fishing method is bottom trawl and mid-water trawl. However, mid-water trawl has not been used recently. All fishing vessels are equipped with Vónin Bacalao bottom trawl with a mesh size 190 mm outside and 155 mm inside. Vessels fish with “flying doors” (semi-pelagic doors) and elevated sweeps that are designated to lift a portion of the sweep line off the seabed.

4.2.7. Market information

The product is marketed as frozen-at-sea, round and H&G (head off, gutted) for Asia, including Japan, China and Korea.

4.3. Principle One: Target Species Background

As noted in section 4.1, the target species or stock for this full assessment is *S. fasciatus*. *S. mentella*, which is indistinguishable from *S. fasciatus* in commercial catches, is categorized in this assessment as an Inseparable/Practically Inseparable (IPI) species owing to its low relative abundance within the 3LN redfish complex. Its status and management is addressed in the P2 section. Therefore, while in this section focussing on P1, we refer to the stock as “redfish” or the “redfish complex” to be consistent with the NAFO management and assessment documents, we are referring to the status and management of *S. fasciatus* unless explicitly noted otherwise.

4.3.1. Stock assessment

4.3.1.1. Source of data

Commercial fishery

During the early 1980s, Cuba, Canada, and the former USSR were the primary fleets conducting directed fishing for redfish in NAFO Div. 3LN (Ávila de Melo *et al.* 2016) (Figure 4). Fishing effort and catch then increased with the entry of Portugal (1986) and South Korea (1987), and various re-flagged fleets. In the early 1990s, the Soviet Union/Russia, Lithuania, and Estonia mid-water trawlers, together with South Korea and Portuguese bottom trawlers, were responsible for most of the fishing effort, which was concentrated by that time on the Beothuk Knoll (Div. 3LMN border, southwest of the Flemish Cap). The decline of catch rates in the mid 1990s led to a reduction of redfish fishing effort and catch, and a shift in effort to Div. 3O.

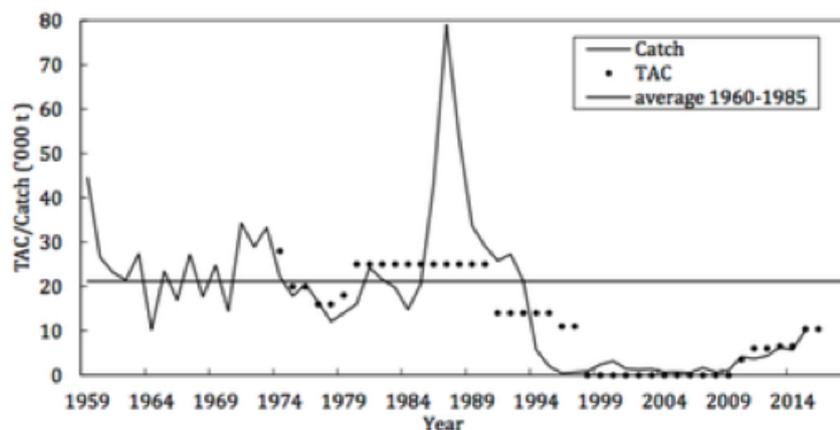


Figure 4. Redfish catch (t) and TAC (t) in 3LN. Source: Ávila de Melo *et al.* 2016.

From 1994 until approximately 2008, most of the redfish catches in Div. 3LN were taken as by-catch in the fishery for Greenland halibut. Portuguese and Spanish bottom trawl fleets were the main fleets responsible for this by-catch during the moratorium years, 1998-2008. Portuguese, Russian and Canadian fleets caught the majority (86%) of the targeted redfish catch in recent years from 2012 to 2015 (Table 4). Quota allocations for 2015 and 2016 are provided in Table 5. Fishing by both Canadian and non-Canadian fleets is largely by bottom trawl; there has been little midwater trawling for redfish since 2012.

Trends in landings

Between 1959 and 1960 reported catches declined from 44,600 to 26,600 t, and then averaged 21,000 t without trend to 1985. Catches rose to a peak of 79,000 t in 1987 and then declined to a minimum of 450 t by 1996 (Table 4). The NAFO Fisheries Commission implemented a moratorium on directed fishing for Div. 3LN redfish in 1998 that lasted through 2008 (Ávila de Melo *et al.* 2014). In 2008, the NAFO Scientific Council recommended consideration of a small amount of direct fishing in 2009, however, the NAFO Fisheries Commission continued with the ban on directed fishing in 2009 but

allowed an increase to a 10% redfish by-catch rate in other fisheries. Evidence that the upward trend in biomass was continuing, in the spring and autumn surveys (NAFO, 2009), led the NAFO Fisheries Commission to reopen the directed fishery and set a TAC for 2010 of 3,500 t. Following the 2010 assessment, the TAC was raised to 6,000 t for 2011 and 2012 and then raised further to 6,500 t for 2013-2014 following the 2012 assessment. Following the 2014 assessment and the Management Strategy Evaluation (MSE), the 3LN redfish TAC was raised to 10,400 t for 2015 and 2016 (Table 5).

Table 4. Catch (t) of redfish in 3LN by nation, 2012-2015. Source: NAFO-Statlant³.

Nation	2012	2013	2014	2015
Canada	920	2,728	1,447	4,447
Cuba	134	-	-	-
Estonia	187	268	471	202
Faroe Islands	30	68	-	64
France (St. Pierre and Miquelon)	38	-	-	3
Lithuania	46	-	-	-
Portugal	1,242	1,191	1,327	2,100
Russia	1,588	1,695	2,062	2,972
Spain	309	282	388	170
Grand Total	4,494	6,300	5,781	9,958

Table 5. 3LN redfish overall quota (t) and each nation's allocation (t). Source: NAFO⁴.

Nation	2015	2016
Canada	4,430	4,430
Cuba	1,019	1,019
European Union	1,896	1,896
Russian Federation	2,292	2,292
Others	63	63
Grand Total	10,400	10,400

Abundance indicators

Commercial CPUE

Earlier assessments concluded that a CPUE time series index of redfish for Div. 3LN was not reflective of year-to-year changes in abundance but may reflect trends over longer periods of time. The current assessment used results of a previous standardizing treatment and derived a single annual catch rate for Div. 3LN. For each year of the 1959-1994 interval, the standardized catch rate is calculated as the ratio between the sum of 3L and 3N STATLANT catch ('000 tons) and the sum of 3L and 3N predicted effort (fishing hours). The commercial catch rate for Div. 3LN increased during the first years of the time series, 1959 through 1967, oscillated around the average catch rate from 1968-1987, and declined thereafter. Over the final years of this CPUE series, 1990-1994, catch rates were stable at a minimum level (Figure 5).

³ <https://www.nafo.int/Data/STATLANT>

⁴ <https://www.nafo.int/Portals/0/PDFs/Quotas/2015.pdf?ver=2016-02-16-075316-163>;
<https://www.nafo.int/Portals/0/PDFs/Quotas/2016.pdf?ver=2016-02-16-075316-210>

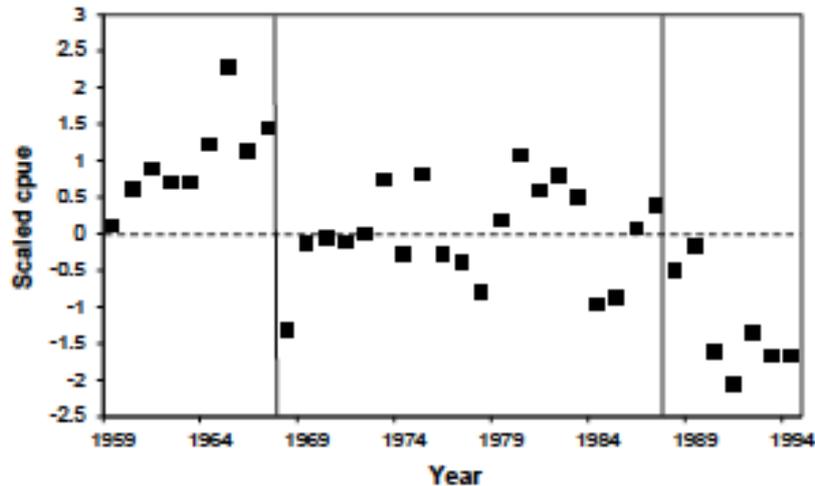


Figure 5. 3LN redfish CPUE, 1959-1994. Source: Ávila de Melo *et al.* 2016.

Research Surveys

Numerous surveys were initiated by Canada prior to 1991, however, only since 1991 have Canadian stratified-random surveys covered both Div. 3L and Div. 3N on a regular annual basis including a spring and an autumn survey. The spring survey has recently conducted 172-206 tows in 3L and 70-94 in 3N. The fall survey has recently conducted 176 tows in 3L and 79 in 3N.

The results of a USSR survey, 1984-1991, have been revised using a standardizing methodology to be comparable to other surveys. Spain began a spring survey in 1995 in 3N and 3O. While different nets have been used, results from fishing trials were used to standardize results from 1995-2000 with 2001-2015 results to derive a 3N survey index. An annual Spanish survey has been conducted in 3L with over 100 valid tows completed since 2006.

The current assessment considers results from seven survey time series in addition to commercial CPUE to tune the population model; all are assumed to index the redfish complex and not the individual species (Figure 6). These include:

- Canadian 3LN spring survey (1991-2005, 2007-2015);
- Russian 3LN spring survey (1984-1991);
- Canadian 3L winter survey (1985-1986, 1990);
- Canadian 3L summer survey (1978-1979, 1981, 1984-1985, 1990-1991, 1995);
- Canadian 3LN autumn survey (1991-2015);
- Spanish 3N spring survey (1995-2013);
- Spanish 3L summer survey (2006-2015).

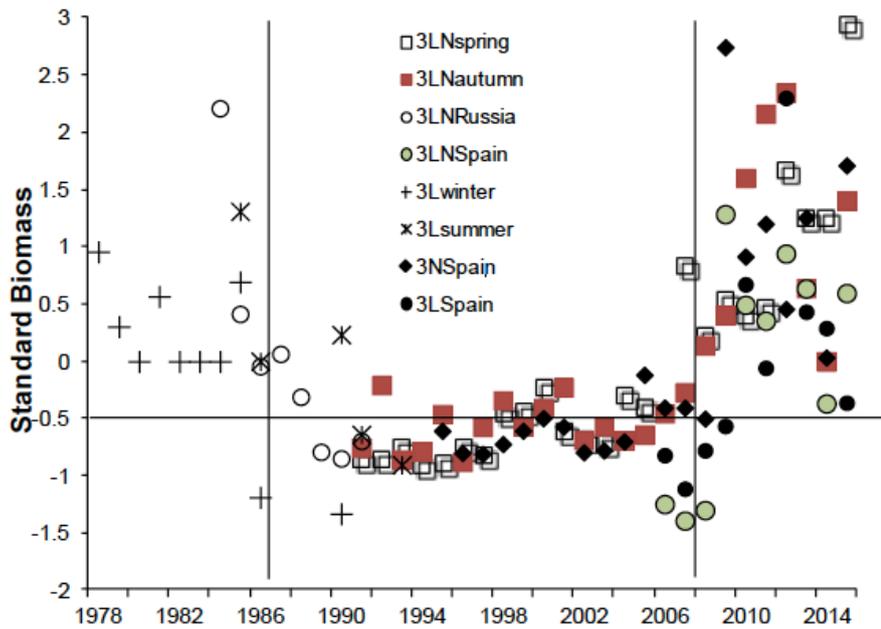


Figure 6. Standardized biomass from bottom trawl surveys included in the 2016 assessment. Source: Ávila de Melo *et al.* 2016.

The survey results collectively indicate a reduction in biomass in redfish from the early 1980s to the early 1990s. The biomass remained below average levels until 1997 when it started to increase with a consistent and large increase from 2007 onwards. As noted in the assessment, while the surveys do not align well during the period of declining abundance (1978-1990) the trends are similar during the increasing phase from mid 1990s to 2015.

Results of recent 2014-2015 Canadian surveys are provided in Table 6 and Figure 7.

Table 6. Biomass (t) for redfish in the spring and autumn Canadian surveys, 1995-2015. Source: Ávila de Melo *et al.* 2016.

Year	Redfish	
	Spring Survey Biomass (t)	Autumn Survey Biomass (t)
1995		90,320
1996	22,812	15,733
1997	14,928	70,334
1998	59,402	111,872
1999	61,495	71,811
2000	87,843	100,426
2001	41,573	132,457
2002	30,959	50,028
2003	27,699	70,871
2004	79,631	49,907
2005	66,462	58,545
2006	35,268	91,850
2007	218,847	124,725
2008	143,978	198,484
2009	183,379	246,695
2010	165,337	461,372
2011	173,693	562,281
2012	321,978	595,987
2013	271,514	288,754
2014	271,746	
2015	480,557	772,900

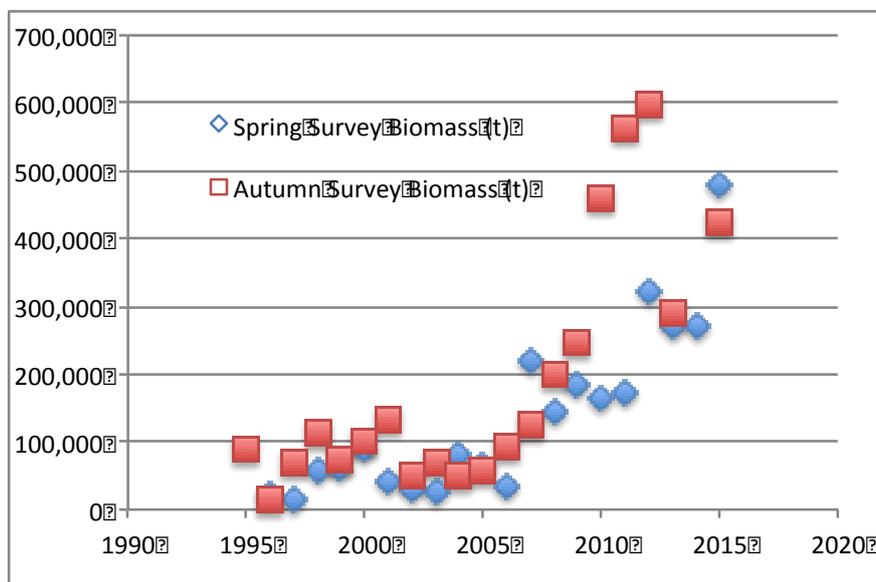


Figure 7. Biomass (t) for redfish in the spring and autumn Canadian surveys, 1995-2015. Source: data from Ávila de Melo *et al.* 2016.

Demographic structure

Survey Fishery Length Composition

Length and otolith data have been collected since 1990 in the fisheries. Canadian spring survey sampling indicates negative anomalies from 2008-2012, particularly 2009, which may indicate strong

incoming year classes corresponding to the increase in survey results (Figures 8 and 9). The surplus production model does not use size or age data as inputs and does not provide estimates of cohort strength.

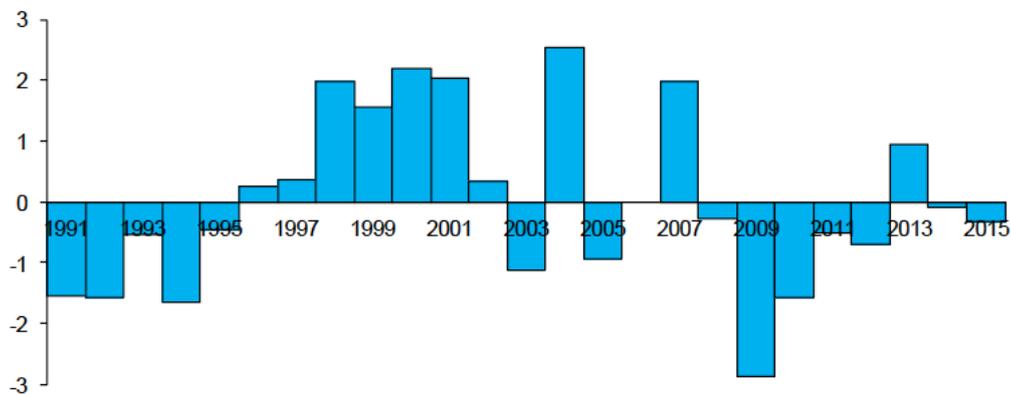


Figure 8. Annual anomalies of mean length from the Div. 3LN Canadian spring survey, 1991-2015. Source: Ávila de Melo *et al.* 2016.

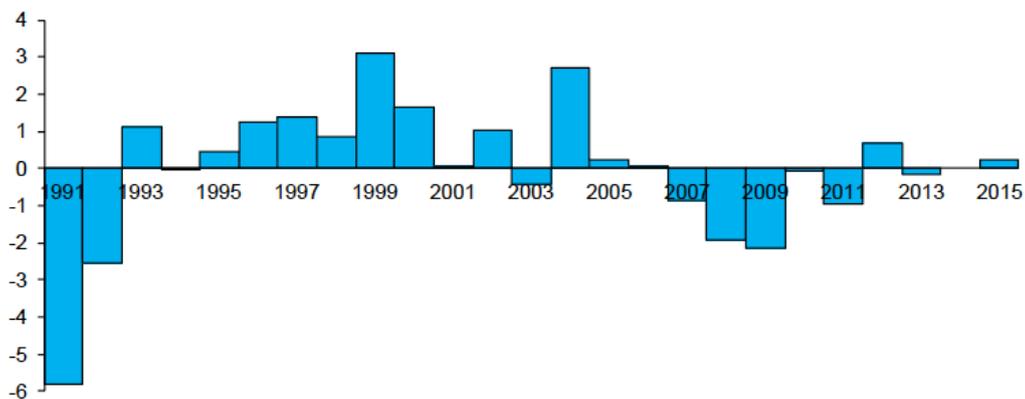


Figure 9. Annual anomalies of mean length from the Div. 3LN Canadian autumn survey, 1991-2015. Source: Ávila de Melo *et al.* 2016.

Commercial Fishery Length Composition

Commercial catches in the Portuguese fishery have been sampled for lengths and otoliths since 1990. The specimens are not identified to species. None of this material is reportedly being aged.

The overall mean length of the 1990-2015 catch was used to derive length anomalies of the 3LN catch over this period (Figure 10). As noted in the 2016 assessment, well below average mean lengths coupled with two digit proportions of small redfish in the catch occurred afterwards on most years between 2006 and 2015. Under a low exploitation regime this could reflect an average level of recruitment on recent years well above the average low recruitment from the 1990's first half of the 2000's. Average proportion of small redfish in the commercial catch rose from 1.0% (1990-2005) to 13.9% (2006-2015) (Ávila de Melo *et al.* 2016).

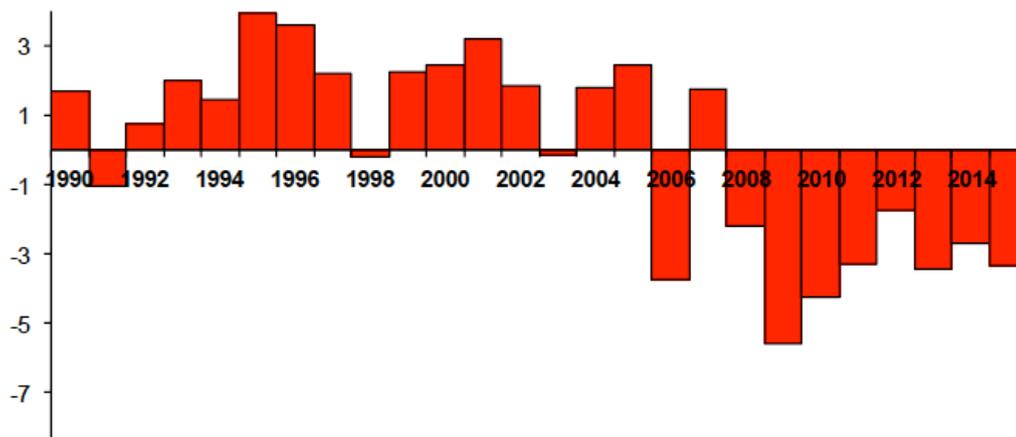


Figure 10. Annual anomalies of the mean length in the commercial catch, 1990-2015. Source: Ávila de Melo *et al.* 2016.

Estimates of Spawning Stock Biomass from the Canadian Survey

Length/sex data from 1991-2015 surveys were converted to estimates of spawning stock biomass using female maturity-at-length and weight-at-length estimates. The results indicate a similar increase in abundance to overall estimates (Figure 11). However, the assessment model inputs total biomass not spawning biomass.

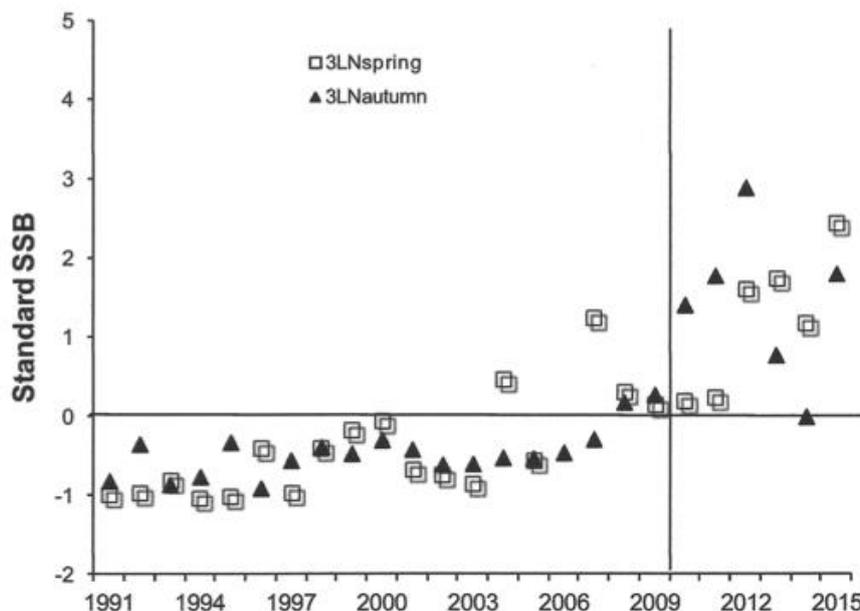


Figure 11. Standardized survey female SSB from spring and autumn Canadian surveys in 3LN, 1991-2015. Source: Ávila de Melo *et al.* 2016.

Genetic Structure

Stock genetic structure has been studied extensively (Sévigny *et al.* 2007, Valentin *et al.* 2014, Valentin *et al.* 2015). A recent interpretation is that there is a single *S. fasciatus* population in Div. 3LN; but this population is not restricted to that area and likely extends further north to Div. 3K, west to Div. 3O and the Gulf of St Lawrence (NAFO 2016).

Species Composition

The recent assessment notes that the two species of redfish are difficult to distinguish; therefore they are reported collectively as redfish in the commercial catch statistics. They are also treated as single species in the Grand Banks surveys carried out by Russia and Spain. The assessment notes that in Div. 3LN, *S. mentella* represents “almost 100% of the commercial catch and the major proportion of the exploitable redfish biomass in Div. 3LN”, however no basis for this statement is provided in the assessment to support this observation even though commercial and survey catches until 2015 were not identified to species.

Canadian survey sampling was modified beginning with the 2015 autumn survey to provide species-specific sampling. The sampling protocol was proposed as follows (subject to modification in future surveys):

1. For each tow where redfish are captured, 1 individual from each 1 cm length grouping will be aggregated, tagged with the consecutive sample number, tow and stratum information, and frozen on-board. If the size range of catches are too constricted to allow a minimum of 10 individuals to be taken in the aggregate sample, the balance will be randomly selected from the catch, bringing the total sample size to 10.
2. Upon return to shore, aggregated samples will be sorted according to depth strata. If possible, 50% of the possible survey sites in each strata will be shore-sampled. This will be achieved by processing all samples if 50% or less of the tows in that depth strata captured redfish. Where 50% or more of the tows in that depth strata produced redfish, preference will be given to those aggregate samples comprised of 10 or more redfish. If this is not possible, an interval will be derived to select 50% of the samples within that depth strata that captured redfish.
3. Selected aggregate samples will be processed in a laboratory setting by an experienced technician trained by DFO staff. Aggregate samples will be thawed and separated and individually processed for biological and genetic samples. Biological processing will include recording length/weight and the anal fin-ray identification key will be applied (based on Ni (1982) and Sevigny (2007)). Redfish with fin ray counts (AFC) < 8 will be assigned as *S. fasciatus* and those with counts > 8 will be assigned *S. mentella*. Genetic sampling will include taking a fin clip of approximately 1 m³ from each individual fish and placing in a 20 ml vial of 95% ethanol (volume ratio of tissue to ethanol cannot exceed 20%). Genetic samples will be identified consistent with the biological and fin ray count sampling.
4. In those samples that are dominated by a single species as identified by the AFC (60% or greater of the remaining sample once fish with AFC = 8 are excluded possess either an AFC < or > 8), those fish with an AFC = 8 will be identified consistent with the dominant species identified from the AFC. Where there is some ambiguity, genetic analysis on samples taken during the thawing process will be utilized to provide insight on species identification using the techniques described by Valentin (2006).
5. Species structure and fin-ray count information will be applied to each DFO depth stratum to provide a reference point for future observations.

Anal fin ray counts (AFC) from redfish samples collected in the 2015 Canadian autumn survey were summarized in GEAC 2016. The intent of the summary was to provide an assessment of the modern depth distributions of *S. mentella* and *S. fasciatus* relative to the depth distribution described by Ni (1982) for Div. 3LN. The following summary is excerpted from the GEAC document except for the additions noted in square brackets.

In the autumn survey samples, the average AFC was less than 8 in all depth strata but >600 m, suggesting that these shallower samples [i.e. <600m] were highly dominated by *S. fasciatus*. There is a slight increase in average AFC over 600m, but the authors suggested that this might be an artifact of the limited sample numbers as only 2 samples were available from this depth and only one of these

samples had an average AFC above 8.0. [Note that for a redfish sample to be taken at least 30 specimens had to be captured in the tow]. In summary, redfish caught in <600 m were predominantly *S. fasciatus* and not only were the catch rates of redfish >600 m were low, but 1 of the two samples was dominated by *S. fasciatus*.

No information was provided by NAFO on the depth distribution of the Canadian fishery in 2014, however the information synthesized from the 2015 offshore fishery when over 4,200 t of redfish spp. were taken in Div. 3LN, clearly demonstrates that the majority of the catch (> 80%) comes from depth less than 500 m, and > 95% of the catch is taken from depths less than 600 m (R. Ellis, pers. comm., NAFO SCS15/08).

The previously assumed species composition of Div. 3LN redfish is based on Ni (1982). Depth distribution of *S. mentella* by this method is presented in (Table 7). It is clear that *S. mentella* was expected to be the dominant species beyond 365 m of depth. However results collected in the fall of 2015 indicate that depths less than 600 meters are, in fact, dominated by *S. fasciatus*. Furthermore, the sampling suggests that *S. mentella* actually comprises significantly less of the biomass than anticipated, as indicated by a very low proportion of samples with AFC counts greater than 8 across all depths and an absence of samples available beyond 650 m of depth. It is clear that *S. fasciatus* comprises a much larger proportion of the biomass than would be expected based on Ni (1982). Furthermore, there is no reason to assume commercial catches would differ significantly from the survey catches.

Table 7. Species breakdown for 3LN redfish from Ni (1982).

Species	Depth				
	<183 m	184-274 m	275-365 m	366-548 m	> 549 m
<i>S. fasciatus</i>	0.983	0.931	0.982	0.275	0.094
<i>S. mentella</i>	0.017	0.069	0.018	0.725	0.906

The assessment of the 2015 Canadian fishery reflects this pattern of distribution with the majority of catches being from < 500 m in depth (Figure 12). Samples collected in the autumn survey in 2015 suggest that these depths would be dominated by *S. fasciatus*. From a conservative perspective, > 90 % of the total catch would be *S. fasciatus*.

In summary, the 2015 survey result indicates that *S. fasciatus* dominates in all but the deepest stratum where redfish catch rates were very low. Thus, since most of the Canadian fishery takes place in < 600 m, the Canadian catch must be strongly dominated by *S. fasciatus*.

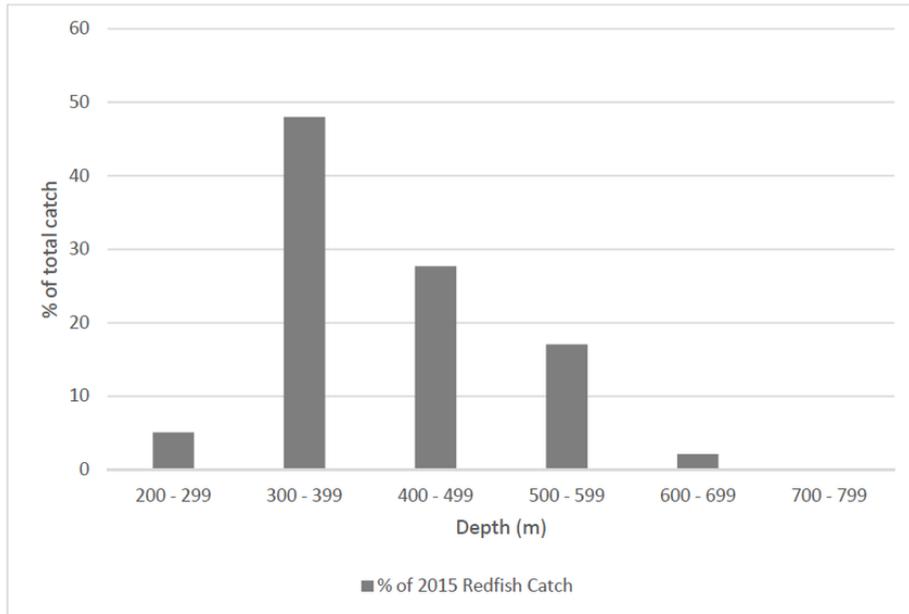


Figure 12. Canadian commercial catch distribution by depth (2015). Bar indicates the percentage of the total directed redfish fishery in Div. 3LN taken from each depth strata. Source: GEAC 2016.

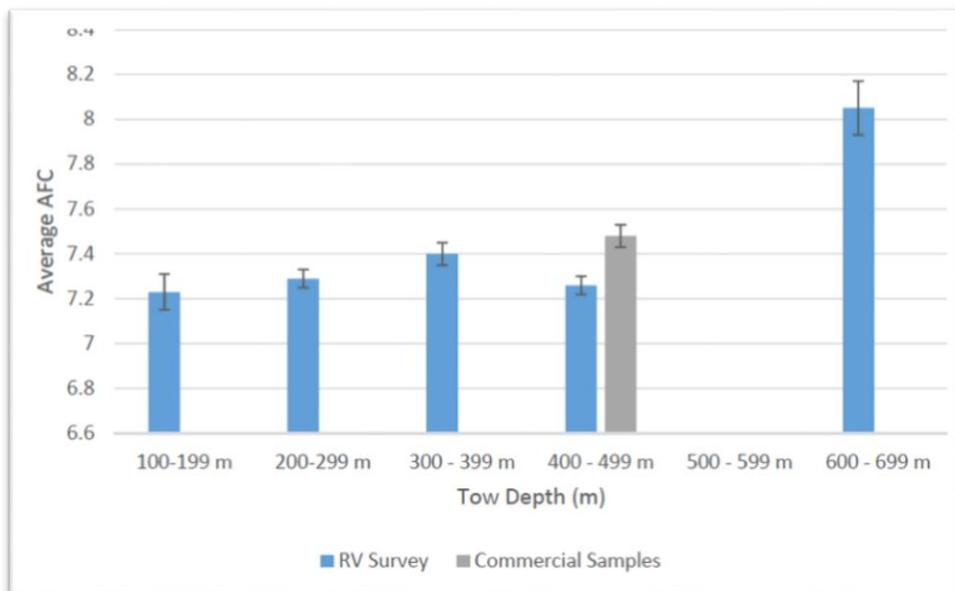


Figure 13. Average AFC by depth (m) of all RV and commercial samples. Bar represents standard error. Source: GEAC 2016.

4.3.1.2. Assessment model

The 2016 assessment (Ávila de Melo *et al.* 2016) differs only modestly from the 2014 assessment (Ávila de Melo *et al.* 2014). The 2016 assessment again treats redfish in NAFO Div. 3LN as one complex because the commercial fish and surveys (prior to 2015) do not routinely identify them to species in the catches. The assessment uses a non-equilibrium surplus production model (current ASPIC model, Ver. 5.56). Principal input parameters were treated as:

- $MSY = rK/4$;
- $B_{msy} = K/2$;

- $F_{msy} = r/2$.

The model fits the carrying capacity (K), and productivity (r) (note: $B_{msy} = rK/4$). All runs use a fixed estimate of MSY at 21,000, the average level of catch for the 1960-1985 interval, when the stock experienced an apparent stability. The 2014 assessment let the model fit MSY but results were viewed as implausible. The model is seeded with a starting guesses for $B_1/K=0.5$ and $K=500,000$ t. Biomass at year 1 was treated as being at B_{msy} . The model is allowed to fit the catchability of each survey independently but was assumed constant over time within each survey. Survey indices were given equal weighting in the model fitting although ASPIC includes an option for un-equal weighting in the fitting process. The model is fit to the catch, CPUE, and survey data.

Principal input data were updated through 2015 to include combined nation total catch (1959-2015), as well as survey data through 2015 and CPUE estimates for their respective time periods depending on the series. Catch and survey indices and model output are expressed in total biomass rather than spawning stock biomass (SSB).

The 2014 assessment examined various survey combinations and options

- Excluding or including CPUE;
- Fixing MSY at 21,000 t or allowing the mode to estimate MSY ;
- Different starting random number seeds;
- Last year's survey biomass;
- Retrospective analysis.

Included in these sensitivity runs were tests of the impact of starting with "pessimistic" or "optimistic" sets of starting inputs with respect to CPUE catchability, K , B_1/K , and inflating or deflating the biomass of the last survey year. These were re-examined in 2016.

The 2016 assessment also examined three survey frameworks, which differed in the treatment of the Spanish survey series.

- APSIC_a: standard (approved 2014 assessment framework): input MSY fixed at 1960-1985 average catch, keep CPUE plus full length former survey series with all outliers, plus 3N Spanish survey;
- APSIC_b: APSIC_a standard plus 3L Spanish survey;
- APSIC_c: APSIC_a standard plus shorter version of 3N Spanish survey and combined 3LN Spanish survey.

All three versions used the surveys series shown below:

- 3LN spring Canadian survey: 1991-2005, 2007-2015;
- 3N autumn Canadian survey: 1991, 1993-2010, 2012-2015;
- 3LN autumn Canadian survey: 1991-2015;
- 3LN spring Russian survey: 1984-1991 (adjusted as per Power and Vaskov, 1992);
- 3L winter Canadian survey, 1985-1986, 1990;
- 3L summer Canadian survey: 1978-1979, 1981, 1984-1985, 1990-1991, 1993;
- 3L autumn Canadian survey long series: 1985-1986, 1990-1994, 1996-2009, 2011-2015;
- 3L autumn Canadian survey short series: 1985-1986, 1990;

Canadian survey data are available for earlier years (pre-1991) but are not considered comparable because of differing distributions of tows by depth and incomplete coverage compared with following years.

Selection of the best or preferred category of model was conditioned by a traffic light approach to the convergence diagnostics. The authors selected second candidate, ASPIC2016b: with MSY fixed at 1960-1985 average catch and the rest of the approved 2014 assessment framework data updated and

adding the 3L Spanish survey. The authors noted that ASPIC2016b provided the better fit between estimated and observed input values, but overall diagnostics and results were very similar between versions 1 and 2.

The assessment estimated the bias-corrected bootstrapped 80% confidence limits of the reconstruction of B/B_{msy} and F/F_{msy} . This version of ASPIC uses a frequentist as opposed to Bayesian approach to estimate uncertainty. In addition to estimating output uncertainty, the assessment examines a wide variety of additional sources of uncertainty through a series of exploratory and sensitivity tests as noted above.

Uncertainties not examined in the assessment included alternative survey weightings (i.e. variance weighted) and the impact of using SSB instead of total biomass. Translating the model to use SSB as opposed to total biomass could improve resolution on how much current harvest is focussing on immature fish, however, the conversion from total biomass to spawning biomass would introduce additional uncertainty.

4.3.2. Assessment results and stock status

Results for the ASPIC_{2016b} run mimicked the 2014 analysis and indicated that redfish biomass has rebounded following the decline following relatively high catches of the mid-1980s to mid-1990s and subsequent moratorium on directed fishing from 1998-2008 (Figure 14). The results project a 2016 total biomass of 261,409 t and a carrying capacity (K) of 376,500 t. B_{msy} is estimated to be 188,200 t. The model indicates a point estimate of relative total biomass (non-bias corrected) for 2014 of 1.38 B/B_{msy} with 80% confidence limits of 0.999-1.595. The historical biomass trajectory indicates that the point estimate of B/B_{msy} exceeded 1.0 in 2011 and been has increasing since.

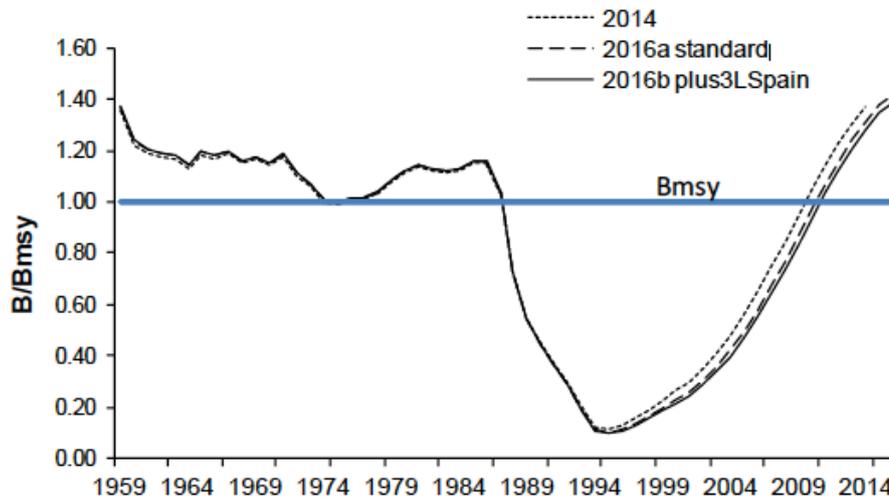


Figure 14. B/B_{msy} trajectories from 2014 assessment and the 2016 ASPIC_{2016b}.

The ASPIC_{2016b} results of the current model indicates that F/F_{msy} (bias corrected values) fluctuated around 1.0 in the early years (1960-1985), increased to values of 1.86-7.09 from 1986-1994, declined to 0.93 in 1995 and then declined further and has fluctuated from 0.04-0.66 during the 1996-2013 period (Figure 15). The 2016 assessment indicates that F/F_{msy} has been below 1.0 since 1995. The estimate was 0.51 for 2015.

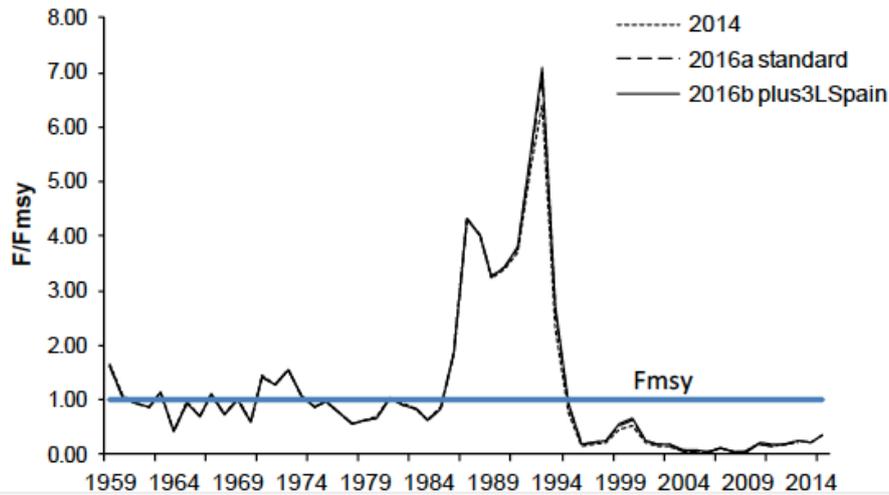


Figure 15. F/F_{msy} from 2014 and 2016 ASPIC_a and 2016 ASPIC_b. Source: Ávila de Melo *et al.* 2016.

The robustness of the assessment was examined with various model configuration and sensitivity tests, noted above and in the previous assessment. The results were reported to be relatively insensitive to these changes (Figure 16). However, no sensitivity tests examined the influence of fixing the value of MSY at a value other than 21,000 t. The authors further noted that even if 21,000 t reflected MSY during the 1960-1995 period; productivity could have changed. Neither time varying productivity nor catchability was explored, nor was the impact on model results of the assumption that biomass at year 1 (1959) was treated as being at B_{msy}

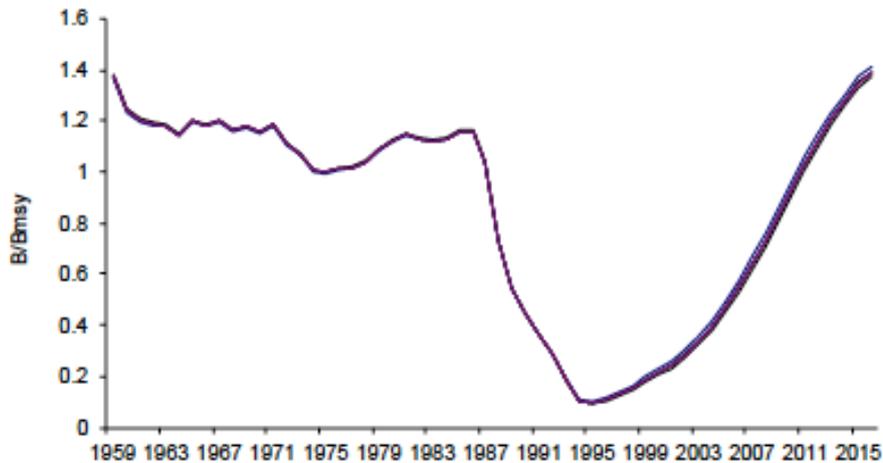


Figure 16. Impacts of different sets of initial parameters and random seeds on APSIC 2016 B/B_{msy} trajectory. Source: Ávila de Melo *et al.* 2016.

Model results were examined with bootstrapping. The authors concluded that the stock at the beginning of 2016 had a “very high probability to be at or above B_{msy} and a fishing mortality (F) in 2015 with a very high probability to be at or below $0.5 F_{msy}$ and that catch has been well below to below surplus production levels since 1995”.

The assessment also re-examined the proposed staging of TAC increase to 10,400 t for 2017 (based on the previous MSE) (see below). The authors concluded that that catch of 2016 at 10 400 t TAC and the approved increase on 2017 and 2018 will maintain biomass at the beginning of 2019 above B_{msy} while keeping fishing mortality till 2018 below F_{msy} (Figures 17 and 18).

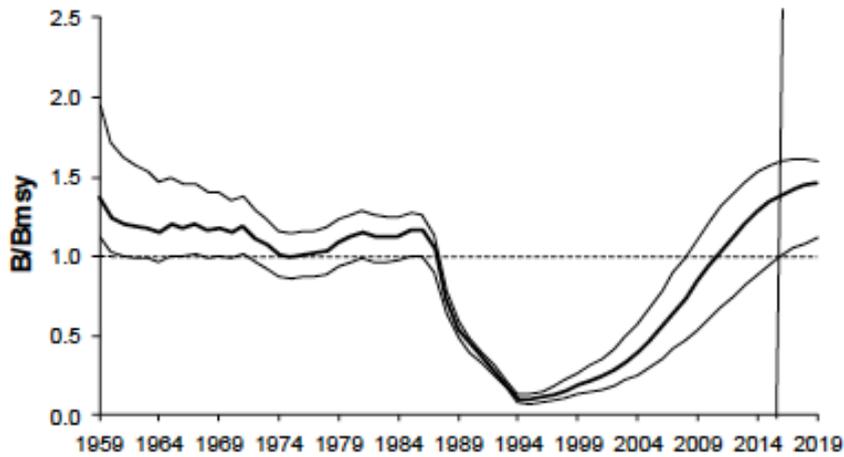


Figure 17. B/B_{msy} 1959-2015 trajectory and 2016-2018 projection under 2014 redfish MSE predicted catch MSE. Source: Ávila de Melo *et al.* 2016.

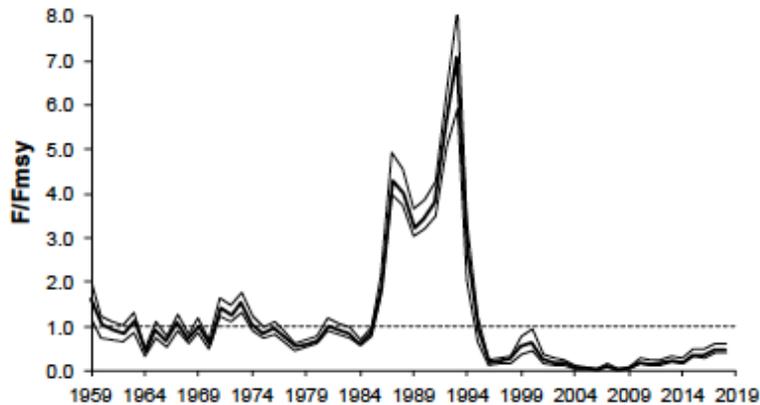


Figure 18. F/F_{msy} 1959-2015 trajectory and 2016-2018 projection under 2014 redfish 3LN predicted catch (point estimates with approximate 80% bias corrected CL's). Source: Ávila de Melo *et al.* 2016.

4.3.3. Other assessment of redfish stock

As noted above, the range of *S. fasciatus* is thought to extend into NAFO statistical areas Div. 3K and Div. 3O. A recent 2014 assessment of redfish in Div. 3O notes that it is not possible to quantify with confidence the absolute size of the stock. However, survey trends for redfish in Div. 3O appear similar to those presented above for Div. 3LN.

A 2011 DFO document conducted a recovery potential assessment (RPA) of the two species. The populations were defined using broader spatial aggregation than Div. 3LN. For *S. fasciatus* in Divisions 1+2+3LNO, the estimated biomass projected for 2010 was 1,876,000 t, with 90% probability intervals ranging from 175,000 t to 8,778,000 t, or 30-225% of B_{msy} . This work, however, only included survey data through 2009 (autumn Canadian survey) or 2010 (spring Canadian survey). The results are consequently more pessimistic about the status in 2010 as opposed to the recent assessment that projects to 2015 and incorporates the apparently steady increase over the 2010-2015 period.

4.3.4. Reference points

The NAFO scientific council developed the existing precautionary framework in 1997 and then revised it in 2004 (NAFO 2004b). For stocks where the Scientific Council can conduct risk analyses, the security margins (F_{buf} and B_{buf}) will be based on the risk levels specified by the Fisheries Commission. For stocks where risk analyses are not possible, the Fisheries Commission will specify the security margins.

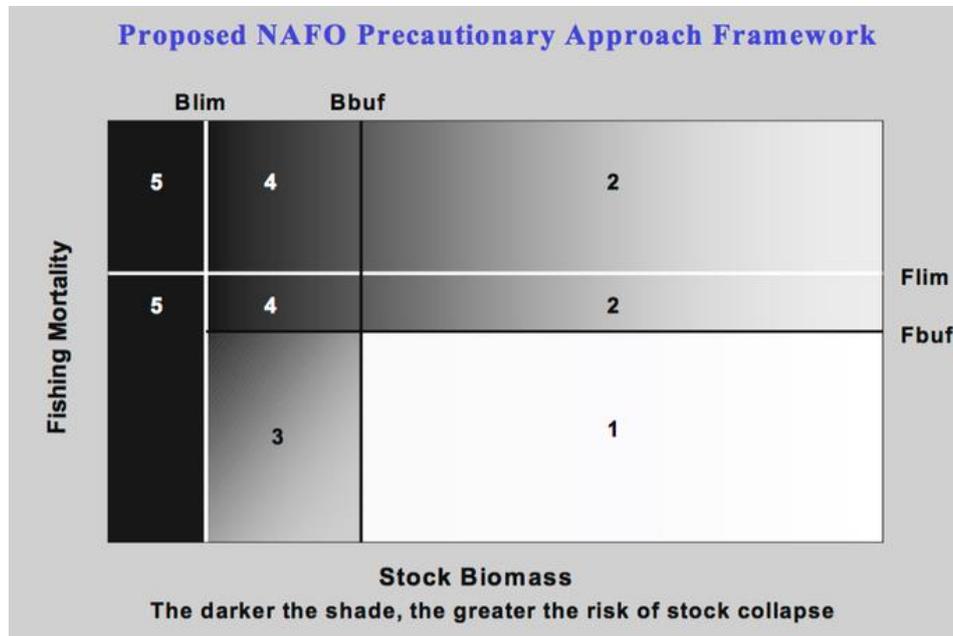


Figure 19. Schematic depicting the revised NAFO PA framework adopted by the Scientific Council in September 2003. Source: NAFO 2004b.

From the NAFO precautionary approach framework, the general reference points are defined as:

- F_{lim} = A fishing mortality rate that should only have a low probability of being exceeded. F_{lim} cannot be greater than F_{msy} . If F_{msy} cannot be estimated, then an appropriate surrogate may be used instead.
- F_{buf} = A fishing mortality rate below F_{lim} that is required in the absence of analyses of the probability that current or projected fishing mortality exceeds F_{lim} . In the absence of such analyses, F_{buf} should be specified by managers and should satisfy the requirement that there is a low probability that any fishing mortality rate estimated to be below F_{buf} will actually be above F_{lim} . The more uncertain the stock assessment, the greater the buffer zone should be. In all cases, a buffer is required to signify the need for more restrictive measures.

When the stock is above B_{buf} and fishing mortality is below F_{buf} , a flexible fishing mortality rate will be selected by managers to achieve desired management objectives, subject only to the constraints defined by the limit and buffer reference points. In particular, a target F should be chosen to ensure that there is a low probability that F exceeds F_{lim} , and a very low probability that biomass will decline below B_{lim} within the foreseeable future.

Stock Biomass reference points

- B_{lim} = A biomass level, below which stock productivity is likely to be seriously impaired, that should have a very low probability of being violated.
- B_{buf} = A stock biomass level above B_{lim} that is required in the absence of analyses of the probability that current or projected biomass is below B_{lim} . In the absence of such analyses, B_{buf} should be specified by managers and should satisfy the requirement

that there is a very low probability that any biomass estimated to be above B_{buf} will actually be below B_{lim} . The more uncertain the stock assessment, the greater the buffer zone should be. In all cases, a buffer is required to signify the need for more restrictive measures.

Management strategies and courses of action are as follows:

Management Strategies and Courses of Action (Time horizons and acceptable risk levels specified by managers)	
Zone 1	Safe Zone: Select and set fishing mortality from a range of F values that have a low1 probability of exceeding F_{lim} in a situation where stock biomass (B) has a very low2 probability of being below B_{lim} . In this area, target reference points are selected and set by managers based on criteria of their choosing (e.g. stable TACs; socio-economic considerations).
Zone 2	Overfishing Zone: Reduce F to below F_{buf} .
Zone 3	Cautionary F Zone: The closer stock biomass (B) is to B_{lim} , the lower F should be below F_{buf} to ensure that there is a very low2 probability that biomass will decline below B_{lim} within the foreseeable future3.
Zone 4	Danger Zone: Reduce F to below F_{buf} . The closer stock biomass (B) is to B_{lim} , the lower F should be below F_{buf} to ensure that there is a very low2 probability that biomass will decline below B_{lim} within the foreseeable future3.
Zone 5	Collapse Zone: F should be set as close to zero as possible.

Key features of the framework include:

- There must be a very low probability that management actions result in projected biomass dropping below B_{lim} within the foreseeable future. Below B_{lim} , fishing mortality should be kept as close to zero as possible.
- The fishing mortality limit should be no higher than F_{msy} . There should be a low probability that realized fishing mortality will exceed F_{lim} .
- Fishing mortality targets are flexible, as long as they remain in Zone 1.
- If a stock assessment generates a current or projected biomass with some probability distribution, operationally the biomass distribution would be evaluated against B_{lim} . In other words, a risk analysis will provide the probability that current or projected biomass is below B_{lim} . If no probability distribution of biomass is available, but a value for B_{lim} exists, Fisheries Commission should establish a buffer zone (B_{buf}), against which the biomass would be evaluated. The same procedure should be used to establish a fishing mortality buffer (F_{buf}). If biomass is in the zone between B_{lim} and B_{buf} , action to reduce F below F_{buf} is required to ensure that there will be a very low probability that biomass declines below B_{lim} in the foreseeable future.

The revised framework attempts to address the managers' concerns as follows:

1) Prescribed harvest control rules (no fishing) below B_{lim} or B_{buf}

The new framework allows fishing below B_{buf} , subject to constraints such as ensuring a very low probability that biomass will fall below B_{lim} in the foreseeable future. However, below B_{lim} , fishing mortality should be as close to zero as possible.

2) A fishing mortality limit at F_{msy} :

Reasons for continuing to advise that $F_{lim} = F_{msy}$ are:

- F_{msy} as a limit is in conformance with the Precautionary Approach as described in several United Nations agreements (in particular, Annex II of the United Nations Straddling Stocks Agreement).
- Fishing somewhat below F_{msy} results in a relatively small loss in average catch, but a large increase in average biomass (which, in turn, results in a decreased risk to the fish stock, an increase in CPUE, and a decrease in the costs of fishing).
- Traditional bio-economic models indicate that the fishing mortality associated with maximum

economic yield (F_{msy}) is usually considerably less than F_{msy} .

- Ensuring no major stock is fished harder than the single-species F_{msy} has often been recommended as a good first step towards ecosystem-based management (NRC, 1999; Mace, 2001). Ecosystem-based management will likely require even more conservative fishing mortality targets than “traditional” single species-based management.

3) The perception of a linear decrease in fishing mortality from the biomass target to the biomass buffer:

- There is a range of options open to managers in this part of the framework (for example, no reduction in F is prescribed if stock biomass is above B_{buf} and F is below F_{buf}). Managers also decide on the levels of B_{buf} and F_{buf} in those cases where the risk of biomass being below B_{lim} or the risk of fishing mortality being above F_{lim} cannot be provided.

4) No consideration of the desirability for stable TACs:

- This is a difficult concept to capture in a simple schematic such as Fig. 2; however, considerable flexibility exists for managers in setting target F levels. Stable TACs are easier to achieve if the fishery remains in Zone 1. Furthermore, maintenance of biomass well above B_{lim} will minimize the instability caused by fishery closures.

5) No consideration of multi-species situations:

- Although the proposed PA Framework is focused on single species, ensuring that no individual species is fished harder than the single-species F_{msy} has frequently been suggested as a first step towards satisfying several important and common ecosystem objectives. In addition, two other aspects of multi-species management were considered in the proposed revision of the PA Framework. First, the de-emphasis of B_{msy} avoids the problem of the impossibility of maintaining all stocks in a multi-species assemblage simultaneously at their respective single-species B_{msy} levels. Second, by replacing the requirement that fishing mortality be zero when biomass is below B_{lim} with a requirement that fishing mortality to be as close to zero as possible in this situation, there is now recognition of the need for a certain amount of flexibility to account for technical interactions that result in unavoidable by-catch of depleted species.

Subsequent to development of the NAFO policy outlined, a NAFO study group recommended that the biomass providing production of 50% *MSY* was a suitable choice for B_{lim} . With the version of surplus production used in the 3LN assessment, this limit corresponds approximately to 30% B_{MSY} (Source: NAFO 2004. Report of the study group – Lorient).

The team did not find any research focused on productivity or reference point for Div. 3LN redfish or either species separately. Work by Duplisea et. al. (2012) working on other (non Div. 3LN) stocks of *S. fasciatus* and *S. mentella* indicated a limited reference point of 40% B_{msy} , as opposed to the NAFO generic value of 30% B_{msy} , might be more appropriate.

4.3.5. Division 3LN redfish specific harvest strategy, harvest control rules and tools

The following Div. 3LN Redfish Conservation Plan & Harvest Control Rules (HCR) was submitted to NAFO in 2015. (Source: unpublished information provided to the team by DFO, October 2015):

1. Preamble:

NAFO sets the Total Allowable Catch (TAC) and national fishing quotas for the 3LN Redfish fishery. Canada holds 42.6% of the TAC set by NAFO. Fishing activity is regulated by NAFO within the NAFO regulatory Area (NRA), and by Canada within its 200-mile zone.

A Harvest Control Rule for 3LN Redfish was adopted by NAFO in 2014 reflecting scientific council advice for this stock (attached as Annex I). The rule was developed in the context of the biomass

being greater than B_{msy} , and evaluated against a range of conservation focused performance statistics. A full review and evaluation of the HCR will occur on or before 2020. In the interim, NAFO will continue to monitor trends in the survey indices for this stock, as well as, conduct periodic assessments (beginning in 2016). Should monitoring/review detect that the biomass is/has declined to a level below B_{msy} , Canadian positions at NAFO would be guided by the supplementary harvest strategy outlined below. The strategy will remain in place until such time NAFO adopts an updated Harvest Control Rule and/or supplementary guidance applicable to this circumstance.

2. Objectives:
The long-term objective of this Conservation Plan is to maintain the biomass in the 'safe zone', as defined by the NAFO Precautionary Approach framework, and at or near B_{msy} .
3. Reference Points:
 - a) Limit reference point for biomass (B_{lim}): 30% of B_{msy}
 - b) Limit reference point for fishing mortality (F_{lim}): F_{msy}
4. Conditions to be satisfied when applying the Harvest Control Rules (Section 5 below):
 - a) Very low (< 10%) probability of biomass declining below B_{lim}
 - b) Less than 50% probability of declining below 80% of B_{msy} on or before 2021
 - c) Low (< 30%) probability of fishing mortality $>F_{msy}$
5. Harvest Control Rules:
 - a) When biomass is below B_{lim} :
 - i. No directed fishing
 - ii. By-catch should be restricted to unavoidable by-catch in fisheries directing for other species
 - b) When biomass is between B_{lim} and 80% of B_{msy}
 - i. TAC's should be set at a level(s) to allow for growth or to avoid or mitigate further decline in biomass consistent with explicit rebuilding objectives
 - c) When biomass is above 80% of B_{msy} below B_{lim} :
 - i. TAC's should be set at a level(s) to allow for growth to B_{msy} or to avoid or mitigate decline below 80% of B_{msy} .
 - d) If fishing mortality is above F_{msy} biomass is below B_{lim} :
 - i. Fishing mortality should be reduced to a level below F_{msy}

The Div. 3LN redfish conservation plan and HCR was adopted by the NAFO Fisheries Commission during the NAFO 38th Annual Meeting held in September 2016. The Fisheries Commission further recommended that the HCR be incorporated into the NAFO Conservation and Enforcement Measures. Results of NAFO's consideration are reflected in a report from the NAFO Joint fisheries Commission-scientific council working group on Risk-based management strategies (NAFO 2016a) as follows:

4. Supplementary Guidance to the 3LN Redfish Harvest Control Rule (Annex 1):
 - a) When biomass is below B_{lim} :
 - i. No directed fishing
 - ii. By-catch should be restricted to unavoidable by-catch in fisheries directing for other species
 - b) When biomass is between B_{lim} and 80% of B_{msy}
 - i. TAC's should be set at a level(s) to allow for growth to above 80% of B_{msy} or to avoid or mitigate further decline in biomass consistent with explicit rebuilding objectives
 - c) When biomass is above 80% of B_{msy}
 - i. TAC's should be set at a level(s) to maintain biomass above 80% of B_{msy} or to avoid or mitigate decline below 80% of B_{msy}
 - d) If fishing mortality is above F_{msy} . Fishing mortality should be reduced to a level below F_{msy} .

Note that the 2016 changes now provide specific actions for when the Div. 3LN redfish stock is found to be between B_{lim} and B_{buf} .

4.3.6. Division 3LN redfish MSE

A management strategy evaluation (MSE) for Div. 3LN redfish was conducted in 2014. The following is redacted from a report to the NAFO Scientific council, June 2014. The 2014 MSE considered four harvest control rules (HCRs):

- **HCR1 stepwise:** Increase the TAC in constant increments starting in 2015 – i.e. $TAC_{y+1} = TAC_y + 1,900$ t to a maximum of 20,000 t. This would provide the following annual TACs:
 - 2015: 8,900
 - 2016: 10,800
 - 2017: 12,700
 - 2018: 14,600
 - 2019: 16,500
 - 2020: 18,400
 - 2021: 20,000
- **HCR2 stepwise slow:** Reach 18,100 t of annual catch by 2019-2020 through a stepwise biannual catch increase, allowing the same amount of increase in TAC every two years between 2015 and 2020. The TAC = 18,100 t is the equilibrium yield in 2014 assessment under the assumption of an MSY of 21,000 t.
 - 2015: 10,400
 - 2016: 10,400
 - 2017: 14,200
 - 2018: 14,200
 - 2019: 18,100
 - 2020: 18,100
- **HCR3: Constant catch** – Maintain TAC = 20,000 t
- **HCR4: Constant F - Set TAC to achieve $F_y = .666(F_{msy})$**

The performance statistics used to evaluate the performance of the HCRs were:

- Low (30%) probability of exceeding F_{msy} in any year;
- Very low (10%) probability of declining below B_{lim} in the next 7 years;
- Less than 50% probability of declining below 80% B_{msy} in the next 7 years.

The MSE concluded that either stepwise HCR (HCR1 or HCR2) satisfied the objectives set out by the performance criteria. NAFO management accepted the HCR2 scenario. Conclusions from the work indicated that the carrying capacity K or MSY could be higher than the estimates from the current assessment and that surplus production models may not be appropriate for this particular stock and its data sets or it would need to be adapted.

The recent assessment (2016) re-evaluated the 2014 MSE recommendations and found that the projected TAC increases will meet the harvest strategy objective of keeping the stock biomass above B_{msy} .

The current harvest strategy (HCR2) is based on the NAFO PA. The current Div. 3LN redfish assessment and the subsequent MSE noted above (Source: NAFO 2014. Risk-based management strategy for 3LN redfish. 36th Annual meeting – September 2014. NAFO/FC Doc 14/29. Ser. No. N6399). Specifically, the harvest strategy adopted for Div. 3LN redfish was to adopt a stepwise slow increment in TACs for 2015-2020. In addition, the performance of the HCR will be monitored by examining the trends in the survey indices and by conducting a full assessment every 2-3 years beginning in 2016; and conduct a

full review/evaluation of the management strategy at the end of the 7-year implementation period (2020). NAFO management further notes that if the assessment results indicate deterioration in stock status such that the probability of transgressing the performance statistics exceeds the probabilities outlined in the MSE, or if catches exceed the TACs defined in the harvest control rule, then exceptional circumstance will be considered to be occurring. The Scientific Council will provide advice on other exceptional circumstances at a later date.

In addition to the schedule for updating the assessment and the HCR of the harvest strategy, catch monitoring and annual bottom trawl surveys that provide annual indices of abundance/biomass will continue to be conducted and evaluated. Operationally, TACs and overall harvest control procedures will be able to accommodate the compliance. Management demonstrated with the successful imposition of the moratorium in 1998-2008, that harvest controls could be implemented.

4.4. Principle Two: Ecosystem Background

UoC 1 Bottom trawl

	List principle 2 Species identified during Scoring Sessions
Retained Species	The main retained species are deep-water redfish (<i>S. mentella</i>), American plaice (<i>Hippoglossoides platessoides</i>), northern cod (<i>Gadus morhua</i>), witch flounder (<i>Glyptocephalus cynoglossus</i>) (2J + 3KL) and roundnose grenadier (<i>Coryphaenoides rupestris</i>). See section 4.4.1.
Minor Bycatch Species	Bycatch level is very low. Minor bycatch species include skates. See section 4.4.2.
Major Bycatch Species	The main bycatch species is blue shark (<i>Prionace glauca</i>). See section 4.4.2.
ETP Species	<i>Species at Risk Act or SARA, Committee on the Status of Endangered Wildlife in Canada or COSEWIC</i> (See section 4.4.3) Northern Wolffish <i>Anarhichas denticulatus</i> (Threatened under the SARA and the COSEWIC) Spotted Wolffish <i>Anarhichas minor</i> (Threatened under the SARA and the COSEWIC) Striped wolffish <i>Anarhichas lupus</i> (Special concern under the SARA and the COSEWIC) Leatherback Turtle <i>Dermochelys coriacea</i> (Endangered under the SARA and the COSEWIC) Marine mammals (See section 4.4.3)

UoC 2 Mid-water trawl

	List principle 2 Species identified during Scoring Sessions
Retained Species	The main retained species is witch flounder (<i>Glyptocephalus cynoglossus</i>) (2J + 3KL). See section 4.4.1.
Minor Bycatch Species	There are no bycatch species. See section 4.4.2.
Major Bycatch Species	There are no bycatch species. See section 4.4.2.
ETP Species	<i>Species at Risk Act or SARA, Committee on the Status of Endangered Wildlife in Canada or COSEWIC</i> (See section 4.4.3) Northern Wolffish <i>Anarhichas denticulatus</i> (Threatened under the SARA and the COSEWIC) Spotted Wolffish <i>Anarhichas minor</i> (Threatened under the SARA and the COSEWIC) Striped wolffish <i>Anarhichas lupus</i> (Special concern under the SARA and the COSEWIC) Leatherback Turtle <i>Dermochelys coriacea</i> (Endangered under the SARA and the COSEWIC) Marine mammals (See section 4.4.3)

Qualitative and quantitative information on non-target species including retained, bycatch and ETP species is available.

Each vessel in the directed redfish fishery must keep logs of each tow. These log entries record for each tow, the start and end time, depth, latitude/longitude at start and end, NAFO division, type of gear used, the mesh size of the gear, and the mandatory reporting of catch by species in kilograms round weight. This log also has space to enter data for the mandatory reporting of species at risk (ETP species).

The tow by tow information gathered on-board the vessel is summarized and relayed to on-shore management, who then completes a daily Hail report which is then relayed to DFO each day.

The observed trip coverage for 2013 and 2014 were 36% and 67% respectively.

Further, the redfish fishery is also subject to 100% dockside monitoring, providing further quantifiable evidence.

4.4.1. Retained species

According to MSC guidance to CR, a species may normally be considered as main if it comprises 5% or more of the total catch in weight. Species comprising less than 5% of total catch may normally be considered as minor, unless it is particularly vulnerable or if the total catch of the fishery is large.

UoC 1 Bottom trawl

As explained in section 4.1.1 and 4.3.1.1. Species composition (p. 26-28), deep-water redfish catches represent less than 10 % of redfish total catch and is then considered as a main retained species. No other species made up more than 5% of total catch with most retained species catches accounting for less than 1% of the total catch (Table 8). However, although catches are less than 5% cod, American plaice, witch flounder (2J+3KL) and grenadier are considered as main retained species given their vulnerability. *S. marinus* is considered neither main nor minor given the extremely low to nil catches.

Table 8. 2013 and 2014 retained catches for the 3LN redfish bottom trawl from observer records.

Species	2013		2014	
	Landings (t)	% of total catch	Landings (t)	% of total catch
Cod <i>Gadus morhua</i>	2	0.1	5	0.3
Witch flounder <i>Glyptocephalus cynoglossus</i>	13	0.5	0.2	0.01
American plaice <i>Hipoglossoides platessoides</i>	6	0.2	0.005	0.003
Atlantic halibut <i>Hippoglossus hippoglossus</i>	18	0.7	4	0.3
Greenland halibut <i>Reinhardtius hippoglossoides</i>	29	1.2	12	0.8
Grenadier <i>Coryphaenoides rupestris</i>	1	0.04	1	0.06
Redfish <i>S. marinus</i>	0.02	0.008	0	0

Deep-water redfish

Redfish stock is assessed as a stock complex. Although, while the assessment indicates there is a high degree of certainty that the stock complex can be considered to be above the point where recruitment would be impaired, there is no available quantitative basis for ascertaining the status of each component relative to reference points. However, see section 4.3.2 for a discussion of the likely relative status of Acadian redfish.

Earlier work, based on the nominal DFO survey results which did not include recent sampling, the nominal trend in abundance for *S. mentella* indicates an increase of approximately 8 (Spring) or 6 (Autumn) times from 1991 to 2015.

However, as discussed in section 4.3.1.1, the calculation of these indices relied on either there is near complete separation by depth which was not the case in the 1970-1980 samples, or the assumption that ratios of the two species within each depth stratum remained constant at the values observed in 1970-80 samples. This assumption, in turn, relies on the premise that the relative abundance within each depth is constant, which is impossible unless the two abundances vary identically over time within each stratum. This already implausible premise was not supported by the results in the Canadian autumn 2015 survey, which indicated a considerably higher proportion of Acadian redfish in all strata than was observed in the 1970-1980 samples.

It can be assumed that the above overestimate of the increase of *S. mentella* given the bias introduced by the assumption of constant species ratios at depth. The degree of overestimation is unknown, but it appears non-trivial. In addition to the uncertainty as to how much the biomass of *S. mentella* actually increased, or even if it has increased since the moratorium, is the uncertainty that even if it has increased a modest amount, it is unknown whether it is now above the PRI, or possibly the population started its recovery well below PRI, and is only now approaching it.

The status of *S. mentella* relative to PRI is currently unknown, however the data are now being collected to examine this issue.

While there is no *S. mentella* specific harvest strategy in place, there is a partial strategy in place to ensure that the fishery does not hinder the recovery of deep-water redfish. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance by imposing a moratorium on targeted fishing from 1998-2008.

American plaice

The American plaice stock in 3LNO has been under moratorium since 1995, at which point the SSB was estimated to have reached an historical low point. In 2011, the Fisheries Commission adopted an “interim 3LN American plaice Conservation Plan and Rebuilding Strategy” and there is a HCR in place for this stock. Bycatch should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.

The stock remains low compared to historic levels and, although SSB is increasing, it is still estimated to be below *Blim* (Figure 20). Recruitment has been low since the late 1980s, but has shown an increasing trend from 2007-2013 (Figure 20). This has been followed by lower recruitments in 2014 and 2015.

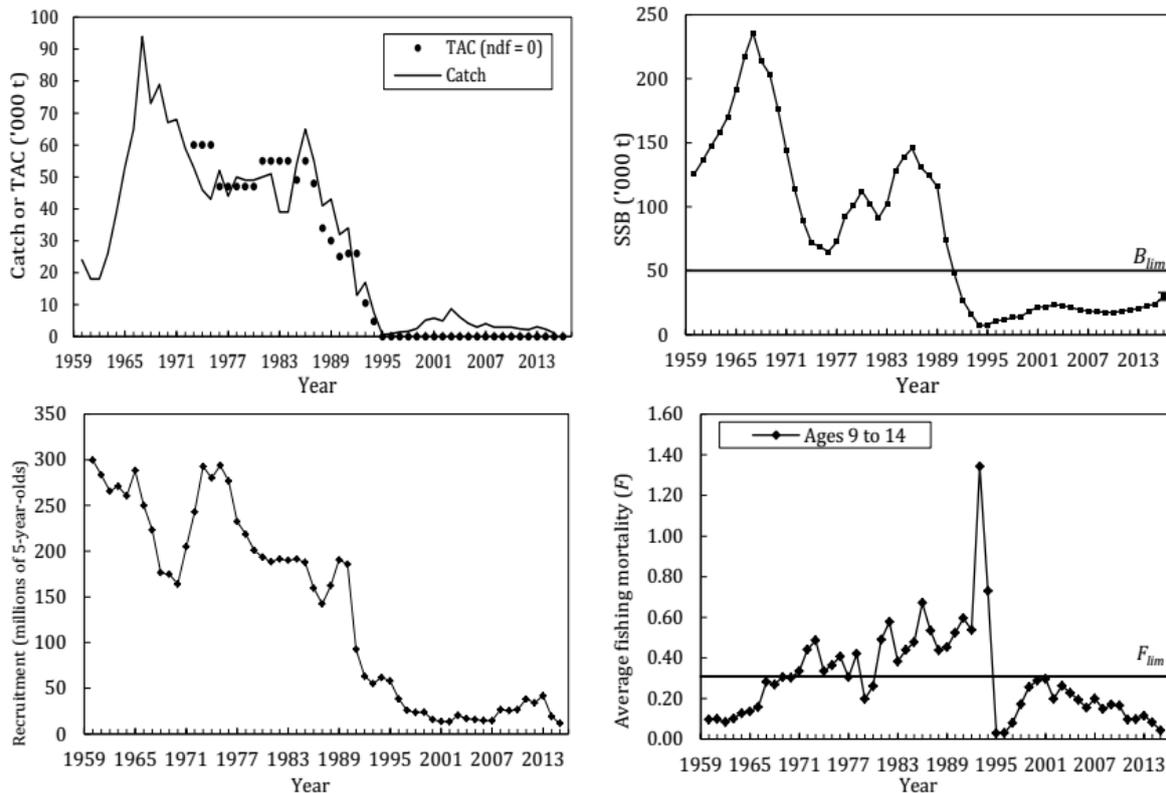


Figure 20. Stock status of 3LNO American plaice, 1959-2013. Source: NAFO 2016, Advice June 2016 for 2017-2018.

There is a partial strategy in place to ensure that the fishery does not hinder the recovery of American plaice. A Conservation Plan, Rebuilding Strategy and HCR are in place. As per licence condition for groundfish (DFO 2014):

- 1) the licence holder/operator is required to forthwith return to the place from which it was taken and, where alive, in a manner that causes the least harm any American plaice less than 20 cm in length when fishing outside Div. 4VWX5.
- 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1250 kg or 5%, whichever is the greater.

The 3LN redfish fishery complies with the licence conditions with a total bycatch of American plaice less than 0.5 % of the total catch (Table 7).

2J + 3KL witch flounder

2J + 3KL witch flounder is under moratorium since 1995 and bycatches in other fisheries should be kept at the lowest possible level. Although showing an increasing trend, the stock remains below B_{lim} (Figure 21). Recruitment during 2013 to 2015 was above average and the fishing mortality is currently low.

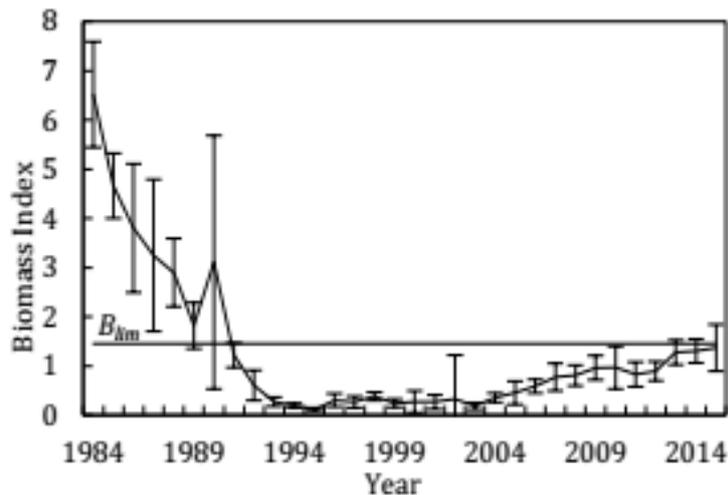


Figure 21. 2J + 3KL witch flounder biomass index, 1984-2014. Source: NAFO 2016, Advice June 2016 for 2017-2019.

There is a partial strategy in place to ensure that the fishery does not hinder the recovery of witch flounder. As per licence condition for groundfish (DFO 2014):

- 1) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species
- 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1250 kg or 5%, whichever is the greater.

The 3LN redfish fishery complies with the licence conditions with a total bycatch of witch flounder less than 1 % of the total catch (Table 7).

Atlantic Cod

3NO cod is under moratorium since 1994 when the SSB was estimated to have reached an historic low level. Similarly to American plaice, an Interim Conservation Plan and Rebuilding Strategy was adopted in 2011. Bycatch should be kept at the lowest possible level.

The spawning biomass has increased considerably over the past five years but the 2015 estimate of 38,454 t still represents only 64% of B_{lim} (60,000 t) (Figure 16). This increase in biomass has been driven by the relatively strong 2005 and 2006 year classes and by fishing mortality values that are amongst the lowest in the time series ($F < 0.1$) and well below F_{lim} (0.3) (Figure 16). More recent year classes do not appear as strong and hence despite the low fishing mortality, the increasing trend in SSB may not persist beyond the short term.

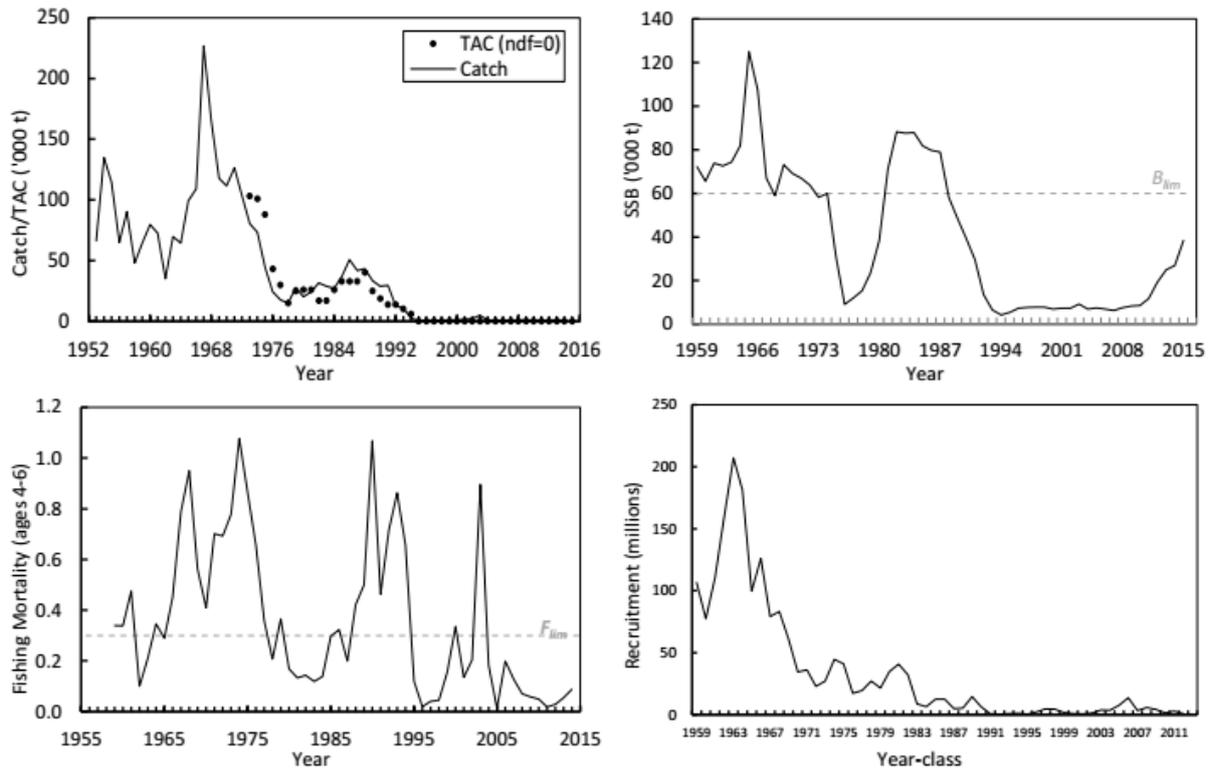


Figure 22. 3NO cod stock status.). Source: NAFO 2015, Advice June 2015.

The last stock assessment report for Div. 2J3KL cod (DFO 2015a) concludes that:

- Indices from the autumn DFO RV survey and the sentinel survey were generally higher in 2014;
- The recent recruitment has improved, but is not expected to result in major changes to SSB relative to the LRP in 2015; and
- The SSB from the autumn DFO RV survey increased from 19% of the LRP in 2011-2013 to 26% in 2012-2014, and although improving, remains in the critical zone (Figure 23).

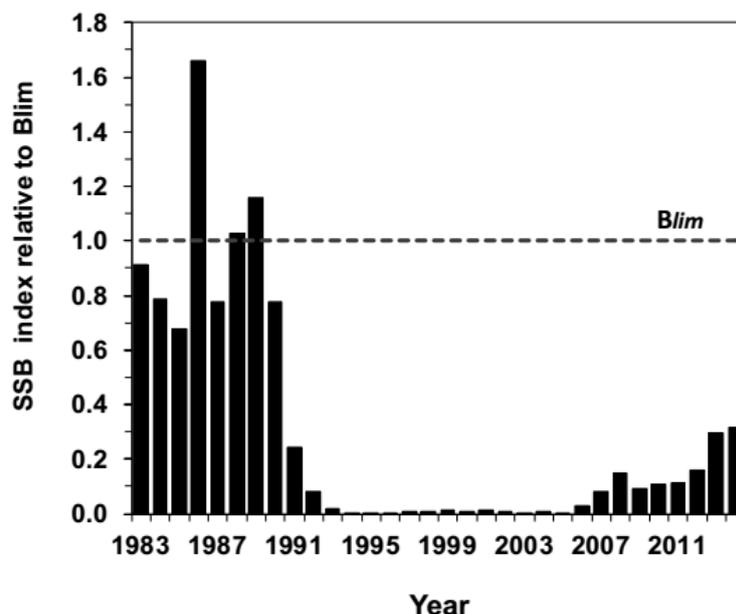


Figure 23. SSB index from autumn DFO RV surveys in Div. 2J3KL. The dashed line is the Limit Reference Point (B_{lim}) which is defined as the average SSB during the 1980s. Source: DFO 2015a.

There is a partial strategy in place to ensure that the fishery does not hinder the recovery of cod. As per licence condition for groundfish (DFO 2014):

- 1) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species
- 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1250 kg or 5%, whichever is the greater.

The 3LN redfish fishery complies with the licence conditions with a total bycatch of cod less than 0.5 % of the total catch (Table 7).

Grenadier

The roundnose grenadier is under consideration for being listed under SARA. Surveys show 98% declines in adult abundance from 1978 to 1994 and further decline from 1995 to 2003⁵. Although much of the population lives at depths greater than those surveyed, adding uncertainty to the assessment, this is the best available information to assess the species status.

There is a partial strategy in place to ensure that the fishery does not hinder the recovery of grenadier. As per licence condition for groundfish, incidental catch for each trip shall not exceed 5% of the weight of the authorized directed species.

UoC 2 Mid-water trawl

Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Retained species information is available for 1988, 1989, 1990, 1992 and 1999.

In 1988, witch flounder and Atlantic halibut represent approximately 3% and 15% of total catch, respectively.

In 1989, witch flounder and Greenland halibut represent approximately 0.7% and 0.4% of total catch, respectively.

In 1990, 1992 and 1999, no retained species were recorded.

The assessment team considers that the level and composition of retained species would be similar if the mid-water trawl would be used nowadays. Because of its vulnerability, the witch flounder is considered as a main retained species. Deep-water redfish is also considered as main retained species. There is a partial strategy in place to ensure that the fishery does not hinder the recovery of witch flounder, and the same licence conditions applied for both bottom and mid-water trawls.

4.4.2. Bycatch species

According to MSC guidance to CR, a species may normally be considered as main if it comprises 5% or more of the total catch in weight. Species comprising less than 5% of total catch may normally be considered as minor, unless it is particularly vulnerable or if the total catch of the fishery is large.

UoC 1 Bottom trawl

Bycatches are very low in the 3LN redfish bottom trawl fishery (Table 9). None of the species accounts for more than 0.5% of the total catch.

The most recent information available on the status of skate species that are likely to be taken by the redfish fishery indicates that populations are relatively healthy (COSEWIC 2005, DFO 2013, Simpson *et al* 2011).

According to DFO and client met during the site visit, the main shark species caught in the redfish bottom trawl fishery is blue shark (*Prionace glauca*). Although the catch is less than 5%, the assessment team considers blue shark as main bycatch species because of its vulnerability. The

⁵ http://www.sararegistry.gc.ca/virtual_sara/files/public/cd-roundnosegrenadierroche-0115_e.pdf

inherent vulnerability of sharks is well documented and is due to their low productivity which is a result of their low fecundity and late age at sexual maturation. Population abundance in the North Atlantic appears to have decreased modestly since 1984 (Campana et al 2015). In recent years, almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines. Canadian sources of blue shark mortality remain a small percentage of total (international) mortality to the North Atlantic population, and the fishing-related mortality in Canadian waters appear to be sustainable (Campana et al 2015).

Table 9. 2013 and 2014 bycatches for the 3LN redfish bottom trawl from observer records.

Species	2013		2014	
	Discards (t)	% of total catch	Discards (t)	% of total catch
Skates spp	7	0.3	0.02	<0.01
Thorny skate	0.489	0.02	3	0.2
Winter skate	0.447	0.02	0	0
Spinytail skate	0.015	<0.01	0	0
Shark	4	0.16	2	0.1
Dogfish	0.163	<0.01	0	0
Eelpout	0.117	<0.01	0.017	<0.01
Blue hake	0.023	<0.01	0	0
Herring	0.002	<0.01	0.002	<0.01
Lanternfish fish	0.02	<0.01	0	0
Jelly fish	0.035	<0.01	0	0
Invertebrates	0.015	<0.01	0	0

UoC 2 Mid-water trawl

There were no bycatches observed in 1988, 1989, 1990, 1992 and 1999.

4.4.3. ETP species

According to MSC (CB3.11.1), ETP species are defined as those that are recognised by national legislation and those that are listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES). Species that appear exclusively on non-binding list such as IUCN Red List or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP species under MSC standards.

Legislative framework^{6,7,8}

The *Species at Risk Act (SARA)* is a piece of Canadian federal legislation which became law in 2002. The purposes are to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and to encourage the management of other species to prevent them from becoming at risk.

⁶ http://www.sararegistry.gc.ca/approach/act/sara_e.pdf

⁷ http://www.cosewic.gc.ca/eng/sct6/sct6_3_e.cfm#hist

⁸ http://www.sararegistry.gc.ca/approach/strategy/Framework_e.cfm

In June 2003, the *SARA* recognized the *Committee on the Status of Endangered Wildlife in Canada (COSEWIC)* as an advisory body, thus ensuring that wildlife species will continue to be assessed using the best available scientific and Aboriginal Traditional Knowledge. The *COSEWIC*, created in 1977, is a committee of experts that assesses and designates which wildlife species are in some danger of disappearing from Canada. Under the *SARA*, the government of Canada will take *COSEWIC*'s designations into consideration when establishing the legal list of wildlife species at risk.

More specifically, the Act:

- requires that the best available knowledge be used to define long and short-term objectives in a recovery strategy and action plan;
- creates prohibitions to protect listed threatened and endangered species and their critical habitat;
- recognizes that compensation may be needed to ensure fairness following the imposition of the critical habitat prohibitions;
- creates a public registry to assist in making documents under the Act more accessible to the public; and
- is to be consistent with Aboriginal and treaty rights and respect the authority of other federal ministers and provincial governments.

The *SARA* is a result of the implementation of the Canadian Biodiversity Strategy, which is in response to the United Nations Convention on Biological Diversity. The Act provides federal legislation to prevent wildlife species from becoming extinct and to provide for their recovery.

Species at risk conservation is built on a cycle of assessment, protection, recovery planning, implementation, and monitoring and evaluation, as shown in Figure 24. It is premised on an adaptive management approach whereby monitoring progress towards achieving the stated conservation and protection objectives and evaluating the effectiveness of adopted strategies are performed on an ongoing basis and are incorporated into each of the different components of the conservation cycle. Early action at appropriate points on the cycle will be encouraged to expedite implementation of effective protection and recovery measures. Consistent with the 1996 Accord, lack of full scientific certainty will not delay measures to avoid or minimize threats to species at risk.

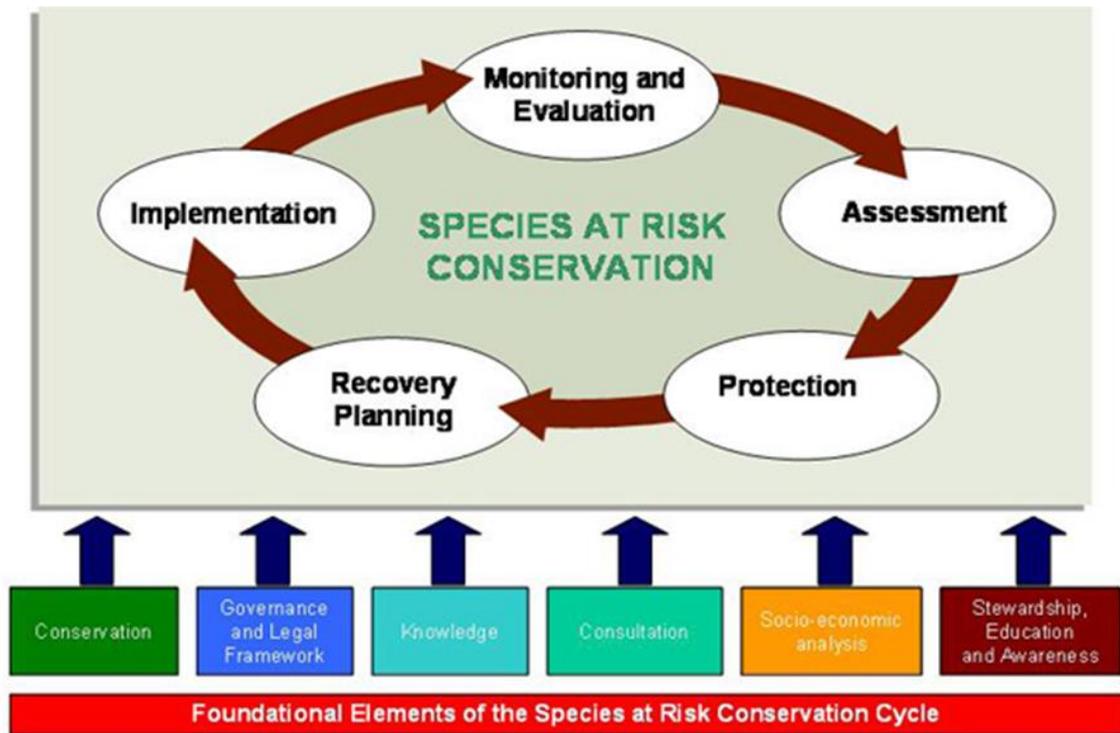


Figure 24. Diagram showing the *Species at Risk* conservation process.

Under the *SARA*, species are classified according to status, namely **extinct, extirpated, endangered, threatened or special concern**⁹.

Furthermore, species listed as threatened, endangered or extirpated are subject to immediate prohibitions. The Act prohibits killing, harming, harassing, capturing or taking such species and makes it illegal to destroy their critical habitat. DFO must plan their recovery by developing recovery strategies followed by action plans within the timelines set out in the Act. Recovery strategies must identify recovery objectives for the species to reach population objectives and specify the recovery feasibility.

Species listed as special concern under the *SARA* are not subject to any prohibitions. However, DFO must develop management plans containing the actions needed for the conservation of these species and their habitats in order to ensure that they do not become threatened or endangered due to human activity.

Wolffish species

In accordance with the recovery strategy for the Northern wolffish and the spotted wolffish, the fishing licences issued under the subsection 22(1) of the *Fishery (General) Regulations* allow licence holders/operators to carry out fishing activities authorized under the *Fisheries Act* that may accidentally kill, harm, harass, capture or take these species. However, licence holders/operators are required to ensure that, while fishing activities are conducted, anyone on board the vessel who accidentally captures a northern wolffish or a spotted wolffish returns it, without delay, to the water in which it was caught and, if the fish is alive, releases it in a manner that causes it the least harm. Moreover, licence holders/operators are required to provide information regarding interactions with species at risk while conducted their fishing operation.

Under the *SARA*, a recovery strategy has been implemented for the Northern wolffish and the spotted wolffish (Kulka et al 2007).

⁹ http://www.sararegistry.gc.ca/species/default_e.cfm

The striped wolffish is listed as special concern under the SARA and was afforded protection under the SARA as of June 2004. Additional protection is afforded through the federal *Fisheries Act*¹⁰. However, as species listed as special concern are not subject to any prohibition, fish harvesters are not required to provide information on its catch. However striped wolffish catches are recorded by observers and returned to the sea by fishermen. Under the SARA, a Management Plan has been implemented (Kulka et al 2007).

The observer data show that the wolffish catches are very low accounting for less than 0.5% of the total catch (Table 10). SARA listing requires that northern and spotted wolffish are released. In support of this, DFO has issued a Tips for handling and releasing wolffish. Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species.

The last Science Advisory Report was for wolffish in the Atlantic and Arctic regions was published in 2013 (DFO 2013). In recent years, there was a very gradual increase in catch rates of Northern wolffish during the DFO spring research survey in Northwest Atlantic Fisheries Organization (NAFO) Div. 3LNO, and during the fall survey in Div. 2J3K and Div. 3LN. In recent years, during the DFO fall research survey in Div. 2J3K and Div. 3LNO, catch rates of spotted wolffish were generally increasing. However, during the spring survey, following a general increase in Div. 3LNO over 1995-2006, catches of this species have been declining. Annual mean number per tow for Atlantic wolffish in the DFO-Maritimes Region research surveys has declined since 1990.

Table 10. Wolffish species catches for the 3LN redfish bottom trawl from observer records.

Species	2013		2014	
	Catch (t)	% of total catch	Catch (t)	% of total catch
Northern wolffish	3	0.1	0.3	0.02
Spotted wolffish	2	0.08	0.3	0.02
Striped wolffish	0.6	0.02	0	0

Leatherback turtle

In accordance with the recovery strategy for the leatherback turtle, fishing licences issued under the subsection 22(1) of the *Fishery (General) Regulations* allow licence holders/operators to carry out fishing activities authorized under the *Fisheries Act* that may accidentally kill, harm, harass, capture or take this species. However, licence holders/operators are required to ensure that, while fishing activities are conducted, anyone on board the vessel who accidentally captures a leatherback turtle returns it, without delay, to the water in which it was caught and, if the turtle is alive, releases it in a manner that causes it the least harm. Moreover, licence holders/operators are required to provide information regarding interactions with species at risk while conducted their fishing operation.

Under the SARA, a recovery strategy has been implemented for the leatherback turtle (Atlantic Leatherback Turtle Recovery Ream 2006). The leatherback turtle is also listed by the International Union for Conservation of Nature (*IUCN*) Red list in Critically Endangered Species of Wild Fauna and Flora, and is included in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (*CITES*), which reduces commercial exploitation of species at risk¹¹.

Satellite telemetry data from 70 leatherback turtles tracked in Atlantic Canadian waters were used to identify important habitat for the species (DFO 2012a). This is the single largest telemetry dataset for

¹⁰ <http://www.dfo-mpo.gc.ca/species-especes/species-especes/wolffish-loup-at-eng.htm>

¹¹ <http://www.iucnredlist.org/search>

leatherbacks in the Atlantic. It includes 65 tags deployed on leatherbacks in Atlantic Canadian waters over an 11-year period (1999-2009). At-sea capture of leatherbacks enables more representative sampling of the population versus the traditional focus on tagging adult females on nesting beaches. The sample considered in this analysis included all sexes and size classes that use Atlantic Canadian waters.

As a result, three primary areas of important habitat were identified including the southeastern Gulf of St. Lawrence and waters off Eastern Cape Breton Island, including Sydney Bight, the Cabot Strait, portions of the Magdalen Shallows and adjacent portions of the Laurentian Channel. The relative probability of residency was estimated (Figure 25).

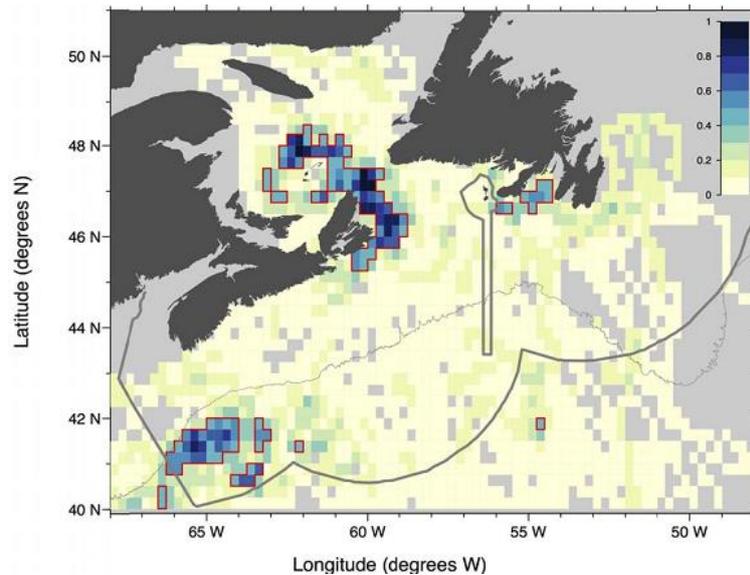


Figure 25. Relative probability of residency estimated from 70 leatherback turtles equipped with satellite tags. Note that all but those areas shaded in light grey were sampled by turtles. Red polygons denote areas where aggregated residency probabilities ≥ 0.4 for all satellite tracked turtles. Thick grey line indicates Atlantic Canadian EEZ boundary, thin grey line indicates 1000 m isobaths. Source: DFO 2012a.

Figure 25 shows that the relative probability of residency of leatherbacks in Div. 3LN is very low.

There were no reported and observed catches of leatherback turtle in the Canada 3LN redfish bottom and mid-water trawl fisheries.

Marine mammal species

Table 11 shows the endangered, threatened and special concern marine mammal species that may occur is the area where the 3LN redfish is prosecuted. There have been no reports of interactions between both redfish bottom and mid-water trawl fisheries.

Table 11. Marine mammal species which may occur in the area where the 3LN redfish is prosecuted, their status under the SARA is given¹².

Common name	Scientific name	SARA
Blue whale	<i>Balaenoptera musculus</i>	Endangered
Fin whale	<i>Balaenoptera physalus</i>	Special concern
Humpback whale	<i>Megaptera novaeangliae</i>	Special concern
North Atlantic right whale	<i>Eubalaena glacialis</i>	Endangered

4.4.4. Habitat and Ecosystem

The Grand Banks are a submarine plateau of approximately 93,000 square km, most of which is within the Canadian 200 NM EEZ off Newfoundland’s south-east coast. The depth of water across most of the Banks is in the range 50-150 m, although the southern and south-eastern edges are deeply incised with submarine canyons, and in these areas the continental slope shelves rapidly to depths of 1,000 m or more (DFO 2007c).

Physical oceanographic conditions are reported annually for the Newfoundland Region (DFO 2012). Important climactic factors such as sea ice cover, salinity, water, and air temperature are compiled and compared to historic data in order to determine any major trends in climate change or physical ecosystem characteristics. Biological and chemical oceanographic conditions are also assessed annually within the Newfoundland Region (DFO 2012). Information related to phytoplankton (microscopic plants) and zooplankton (microscopic animals) biomass, as well as nutrient composition, is collected and analyzed in order to discern any major trends in ecosystem composition over time.

Legislative and Policy framework

Canada

In 1986, DFO implemented the *Policy for the Management of Fish Habitat* (Habitat Policy) to support the habitat protection provisions of the *Fisheries Act*¹³. Under the *Fisheries Act*, “fish habitats” are defined as those parts of the environment “on which fish depend, directly or indirectly, in order to carry out their life processes”. The *Act* also defines “fish” to include all life stages of “fish, shellfish, crustaceans, marine mammals and marine plants”. Accordingly, pursuant to the *Act*, this policy will apply to all projects and activities, large and small, in or near the water, that could “alter, disrupt or destroy” fish habitats, by chemical, physical or biological means, thereby potentially undermining the economic, employment and other benefits that flow from Canada’s fisheries resources.

The Habitat Policy's three goals include:

1. **Conservation** of existing habitats;
2. **Restoration** of damaged habitat; and
3. **Development** of new habitats.

The first goal of conservation is to ensure that the current productive capacity of existing fish habitats supporting Canada’s fisheries resources is maintained by applying the *no net loss* guiding principle. Under this principle, Habitat Management Program (HMP) staff work with proponents to ensure their project proposals avoid harm or impacts to fish and fish habitat. If however, fish habitat losses are unavoidable, the productive capacity can be compensated by replacing or enhancing fish habitat.

The restoration and development goals build on the conservation goal in order to achieve a *net gain* in productive capacity. HMP staff work with others to rehabilitate the productive capacity of fish habitats or create new fish habitats in selected areas where economic or social benefits can be achieved through the fisheries resource.

¹²http://www.sararegistry.gc.ca/sar/index/default_e.cfm

¹³ <http://www.dfo-mpo.gc.ca/Library/23654.pdf>

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 61/105¹⁴. The purpose policy is to help DFO manages 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 Framework¹⁵ 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.

The 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 is 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.

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)¹⁶ which builds on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the

¹⁴ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm>, <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-back-fiche-eng.html>

¹⁵ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-eng.pdf>

¹⁶ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>

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 incorporates existing policies with new and evolving policies using a phased-in approach. It also includes 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)¹⁷
- Managing Impacts of Fishing on Benthic Habitat, Communities and Species (April 2009)¹⁸
- Policy on New Fisheries for Forage Species (April 2009)¹⁹
- Ecological Risk Assessment Framework for Coldwater Corals and Sponges dominated communities (April 2013)²⁰
- Policy on Managing Bycatch (April 2013)²¹
- Guidance on Implementation of the Policy on Managing Bycatch (April 2013)²²

The implementation process will use adaptive management principles, whereby experience applying the policies to fisheries management will guide future applications. Integrated Fisheries Management Plans (IFMPs) will 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. The Ecosystem Science Framework was developing 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 components²³. A Five-Years Research Plan (2008-2013) has been developed to support the ecosystem science through its 20 components and their connections.

This Research Plan showed how four of the priority areas will be addressed primarily through Ecosystem Research Initiatives (ERIs) that address regional research including: Fish Population and Community Productivity, Habitat and Population Linkages, Climate Change / Variability, Ecosystem Assessment and Management Strategies. Each of the Ecosystem Research Initiatives, Centres of Expertise and the Climate Change Science Initiative are strongly influenced by the Ecosystem Science Framework and will produce new knowledge and improve existing knowledge that will be needed for integrated management and demonstrate a strong commitment to research to our clients and partners. Each ERI will serve as a pilot for DFO's ecosystem-based approach by focusing on regional research priorities. This will allow integrated research on a particular ecosystem with predefined

¹⁷ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>

¹⁸ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-eng.htm>

¹⁹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/forage-eng.htm>

²⁰ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-eng.htm>

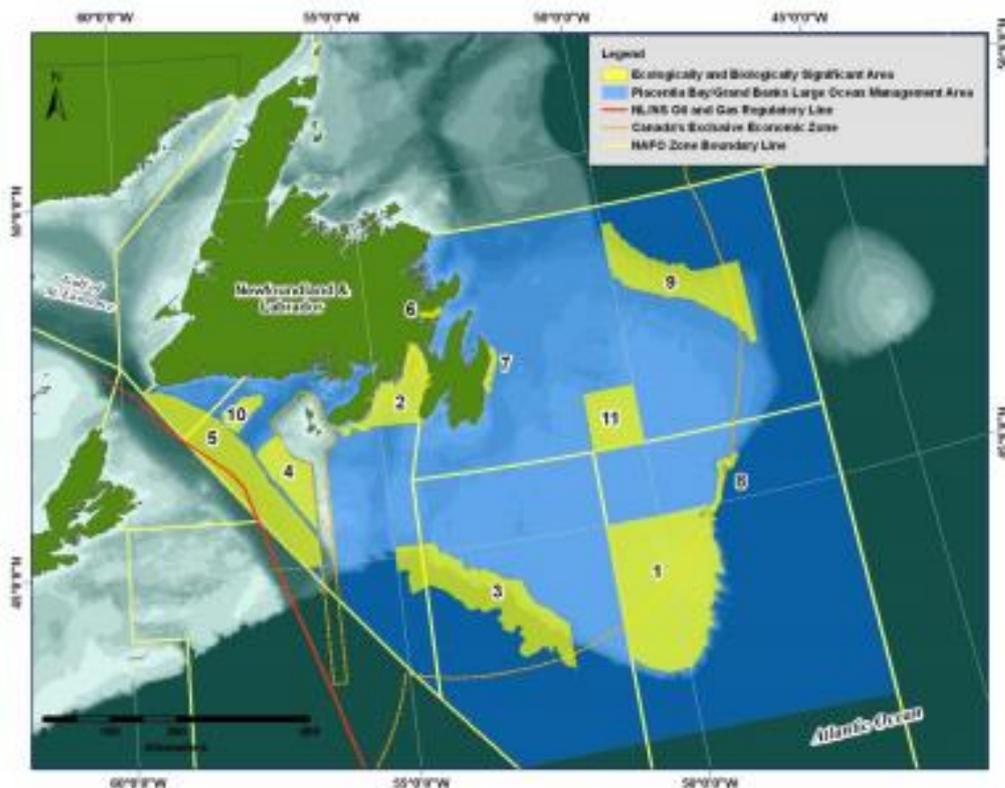
²¹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-policy-prise-access-eng.htm>

²² <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-guide-prise-access-eng.htm>

²³ <http://www.dfo-mpo.gc.ca/science/publications/fiveyear-plan-quinquennal/index-eng.html>

geographical boundaries and the knowledge gained from large-scale ecosystem studies will allow the development and testing of tools required to manage human activities within our aquatic ecosystems. Before we can begin to understand how human activities might impact ecosystem components we need to first understand how ecosystems function and how they respond to drivers or perturbations. Thus, the general themes within each ERI include: 1) understanding ecosystem processes, 2) understanding the impacts of climate variability, and 3) developing tools for ecosystem-based management.

Because of the wide variety of human use and pressure, Placentia Bay-Grand Bank was one of the first marine ecosystems in Canada to be recognized as a Large Ocean Management Areas (LOMA) that required action by the Government of Canada under the *Ocean Act* to ensure the sustainable development of its human uses (Dufour and Ouellet 2007). 11 different Ecologically and Biologically Significant Areas (ESBA) have been identified within the Placentia Bay-Grand Bank LOMA (Figure 26). The identification of EBSAs is considered a useful tool for bringing attention to areas that have some particular ecological or biological significance, and focuses attention on the area allowing a greater-than-usual degree of risk aversion in the management of activities (DFO 2012b).



Key: EBSAs in order of Significance	
1. The Southeast Shoal and Tail of the Banks	7. Eastern Avalon
2. Placentia Bay Extension	8. Lilly Canyon-Carson Canyon
3. The Southwest Shelf Edge and Slope	9. Northeast Shelf and Slope
4. St. Pierre Bank	10. Burgeo Bank
5. Laurentian Channel and Slope	11. Virgin Rocks
6. Smith Sound	

Figure 26. Placentia Bay-Grand Banks LOMA and its EBSAs. Source: DFO 2012b.

NAFO

NAFO began the implementation of an ecosystem approach to fisheries management²⁴ in the years following the publication of the FAO Guidelines on Deep Sea Fisheries. In addition to the traditional stock assessment of commercial fish species, NAFO also required advice regarding vulnerable species and habitats. In response, the Scientific Council established a new Working Group on the Ecosystem Approach to Fisheries Management (WG-EAFM), which began meeting 2008, to identify and delineate marine benthic habitats subject to significant adverse impacts and in need of protection. This Working Group aided in changing the NAFO Conservation and Enforcement Measures to prohibit bottom fishing in a number of areas where VME indicator species were known to occur in high densities, and placing stocks of forage fishes, such as Capelin in Div. 3NO, under long-term moratoria, recognizing the important role they play in the food-web.

In 2013 the working group changed its name to the Working Group on Ecosystem Science and Assessment (WG-ESA) and in recent years, importance has been placed on encounter thresholds with sponges and corals, ecological interactions between cod, redfish and shrimps, and comprehensive lists of VME indicator species and VME elements discussed.

In addition a joint Fisheries Commission and Scientific Council Working Group on the Ecosystem Approach Framework to Fisheries Management (WG-EAFFM) was established to report ecosystem developments and the work of WG-ESA, to both the Fisheries Commission and Scientific Council, to consider the advice of Scientific Council, and to provide recommendations to the Fisheries Commission.

In 2009, NAFO published a Coral Identification Guide to help those on-board commercial and research fishing vessels to identify and record the various species of coral likely to be commonly encountered in fishing trawls. In 2010 this was followed by a Sponge Identification Guide. As well a fishery data collection form for identifying species of corals and sponges has been included in the NAFO Conservation and Enforcement Measures. In 2012, drawing on the latest scientific information, NAFO expanded the list of VME indicator species (now recognizing 67 species which signal a potential VME) and adopted a new list of VME elements in line with the FAO International Guidelines.

Spatial distribution of habitats in Div. 3LN

The seabed of the Grand Banks is essentially made up of sediments draped over topography created during a rift phase of seafloor spreading (Mason et al., 1984) (Figure 27). The shallower areas of the Grand Banks are primarily sand, with higher mud content on the slope and primarily mud on the outer edges of the Grand Banks.

²⁴ <https://www.nafo.int/Portals/0/PDFs/GeneralInfo/New%20NAFO%20posters-EAF-letter.pdf?ver=2016-02-16-064208-157>

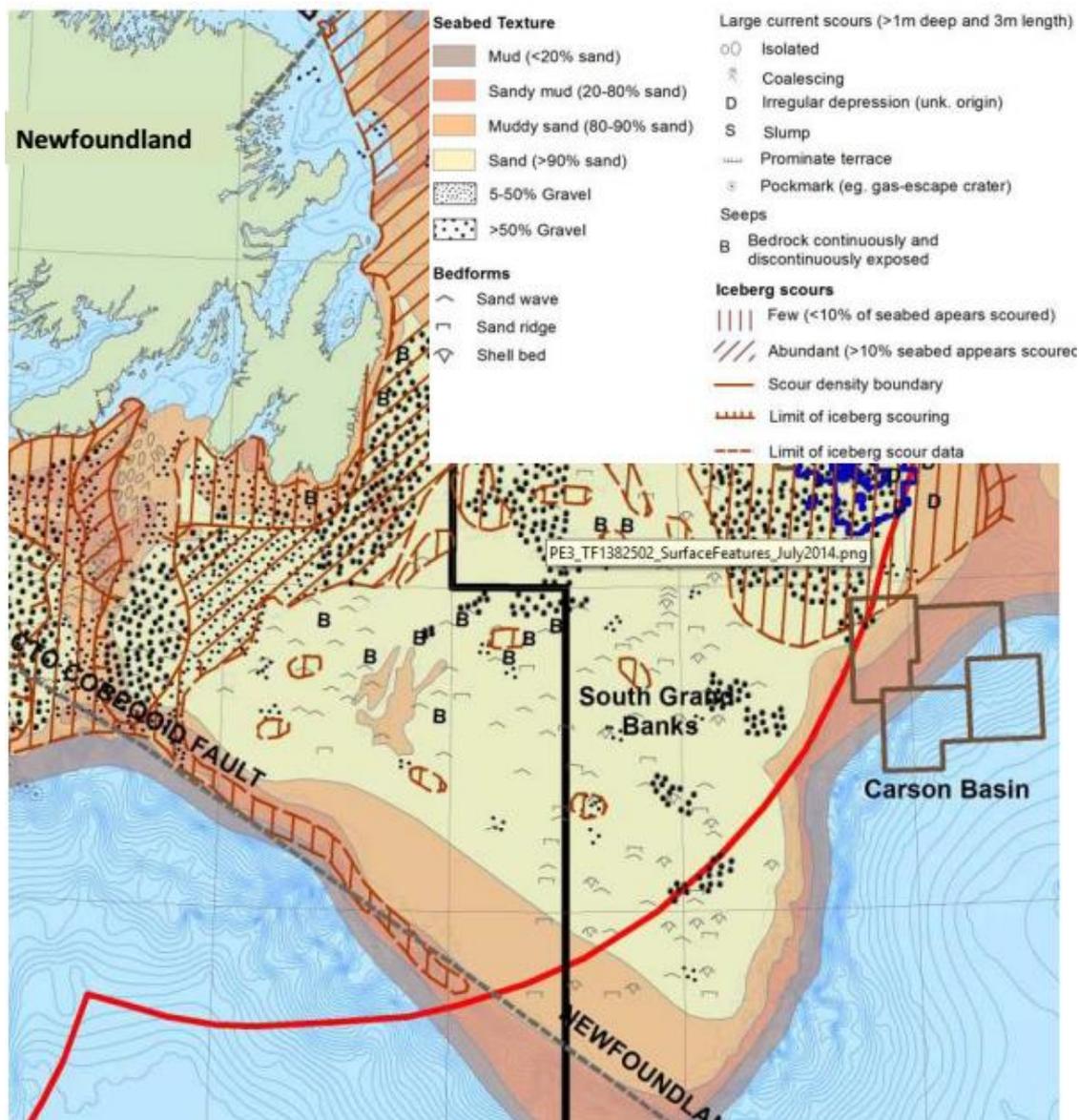


Figure 27. Geological characteristics of the Grand Banks.

Deep-water corals and sponges have been identified as Vulnerable Marine Ecosystems (VMEs). Their occurrence in NAFO Div. 3LN are shown in Figure 28.

The distribution of deep-water corals of the Flemish Cap and the Grand Banks have also been investigated based on the bycatch from Spanish/EU bottom trawl groundfish surveys between 40 and 1,500 m depth (Figure 29).

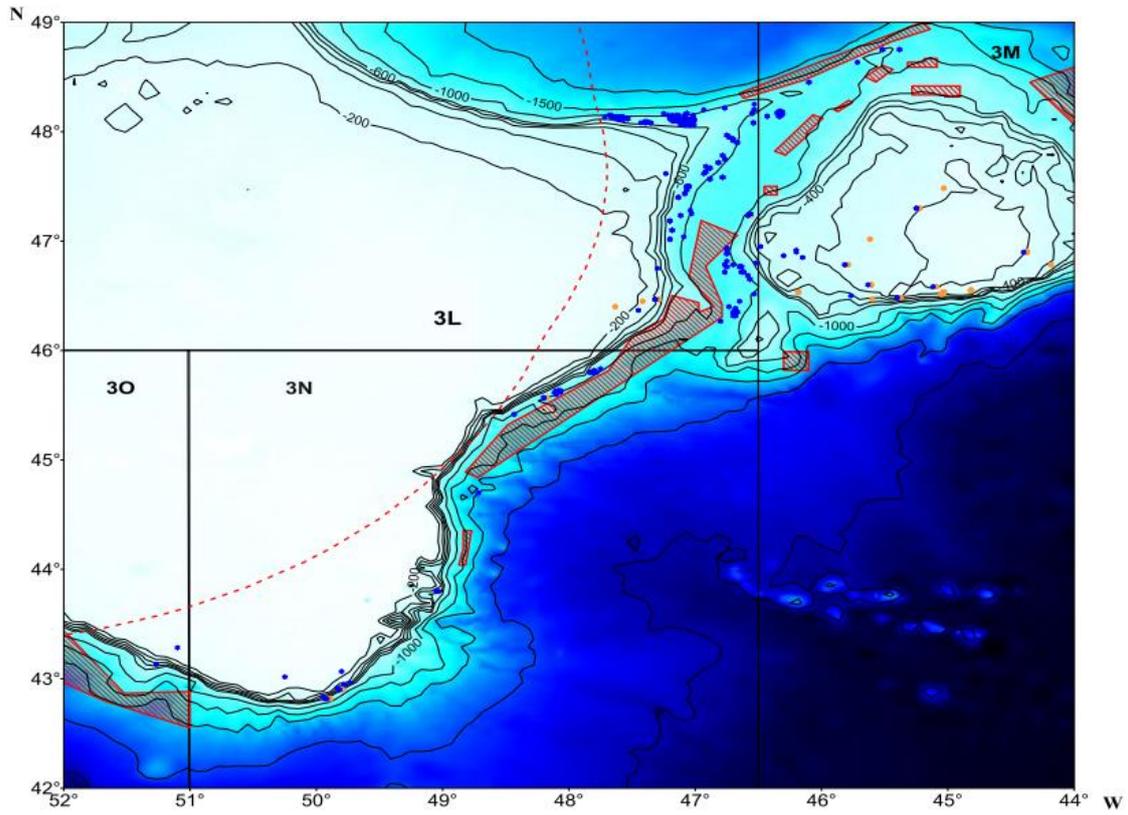


Figure 28. Occurrence of deep-water corals and sponges within NAFO Div. 3LN in 2008-2013. Bleu dots are corals, orange dots are sponges, dotted red line is the boundary of 200-mile zone, and the hatched red areas are areas closed to fishing. Source: Vinnichenko et al 2014.

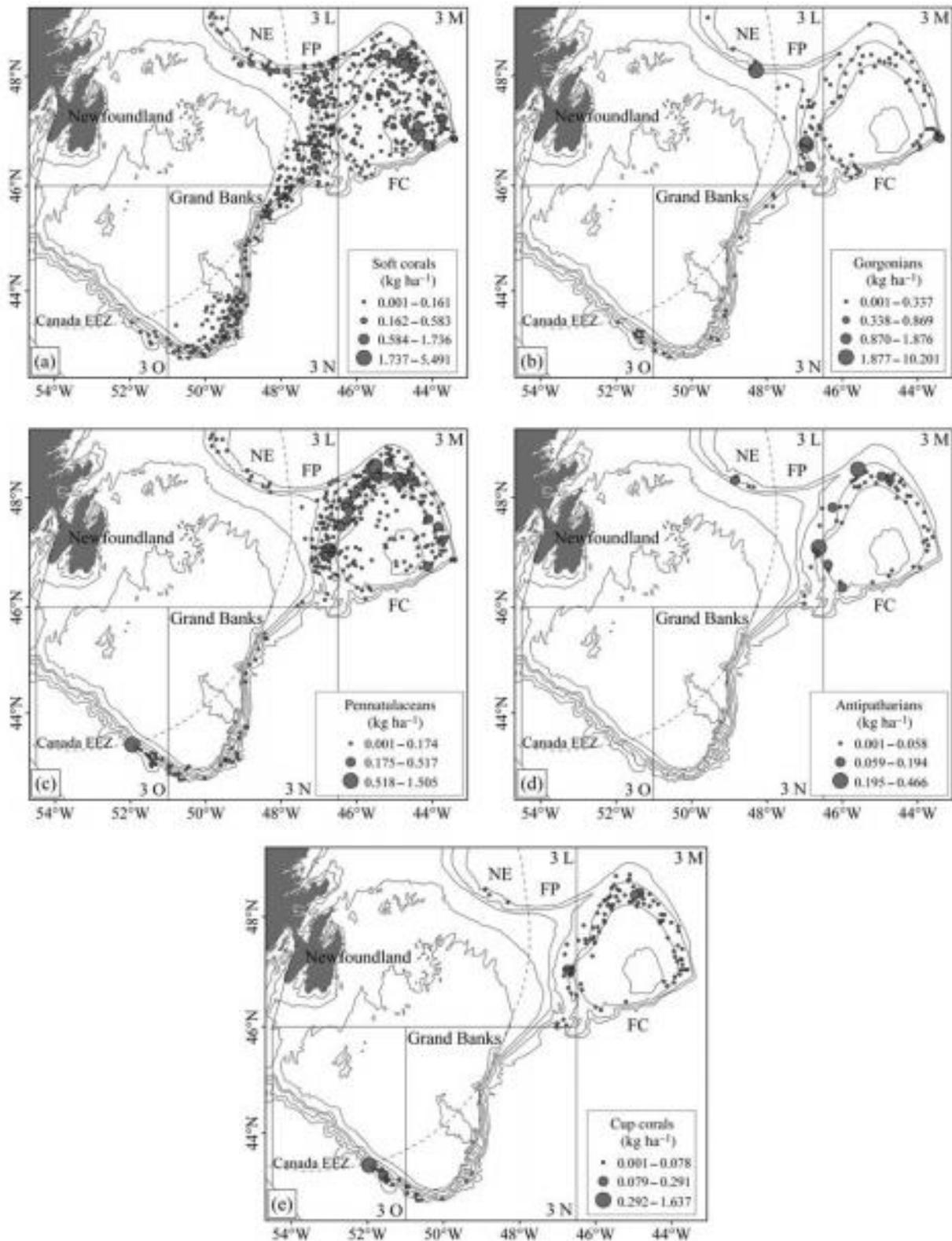


Figure 29. Distribution of deep-water coral biomass in the study area (NAFO Divisions 3LMNO). (a) Soft corals; (b) gorgonians; (c) pennatulaceans; (d) antipatharians; (e) cup corals. The size of the symbols (dots) represents the biomass per swept area (kg ha^{-1}). Note that the scale is not the same in all the maps. Intervals were obtained by Jenks' natural breaks from ArcGIS 9.1 classification. The depth contours indicate 50, 100, 200, 500, 1000, and 1500 m. FC, Flemish Cap; FP, Flemish Pass; NE, northeastern slope of the Grand Banks. Source: Murillo et al 2011.

Impact of 3LN redfish fisheries on habitats

The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014 (Spatialanalysis 2015).

Highlights of the Canada 3LN Redfish footprint analysis, as averaged for the period 2011 to 2014, is summarized below:

- Of the 5,922 cells (1 cell corresponds to a sea area of approximately 6.25 nm²) that make up the 3LN area within the 100-900 meter depth range, on average only 133 or 2.2% of them were traversed by GEAC-member vessels. Of the 133 cells traversed, 3.8% of them on average account for one third of the landed weight. Another 6.7% of them on average account for the next third of the landed weight. On average, the fishing activity in the Top and Middle 3rd of the fishery, which accounts for two-thirds of the annual landed weight, occurs in only 14 of the 5,922 cells that make up the 3LN area.
- According to the underlying surficial geology, the 3LN redfish habitat area within the 100-900 meter depth range is composed of 41% sand, 28% muddy sand, 23% sandy mud and 3% mud; 5% of the area was not mapped. Most of the redfish fishing activity occurs on muddy sand and sandy mud sea bottoms (Figure 29-31). No fishing activity occurred on sand and, on an average annual basis, only 2.7% of the muddy sand, 5.9% of the sandy mud and 4.6% of the mud habitat was fished.
- The average figures for the 4-year period suggest that 88% of the 133 cells traversed by GEAC-member vessels were traversed for less than 24 hours in a calendar year. The average figures further suggest that 41.7% of the cells traversed were traversed for less than 1 hour in a calendar year.
- Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM² area (3LN within 100-900 meter depth) was swept on an annual basis.
- There are no areas of significant sponge concentrations in the 3LN redfish habitat area. There is potential overlap with respect to two designated areas of coral concentrations. With one exception, virtually all of the fishing effort in these areas are not in proximity to the relevant DFO research vessel sets. Observer results for 2013 and 2014 indicate that no coral was present in the commercial catch.

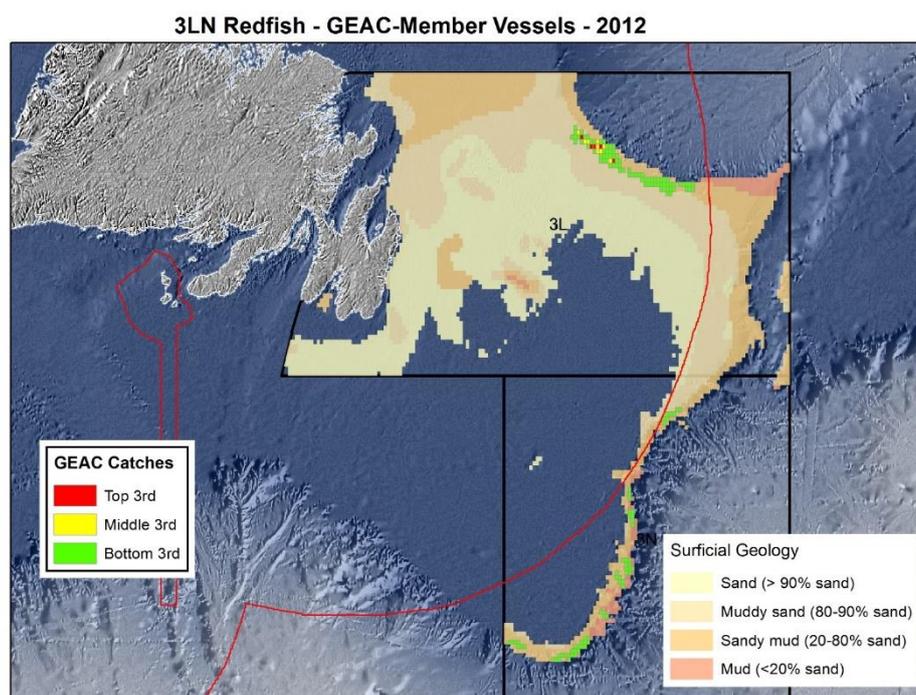


Figure 30. Footprint of the 3LN redfish bottom trawl fishery in 2012.

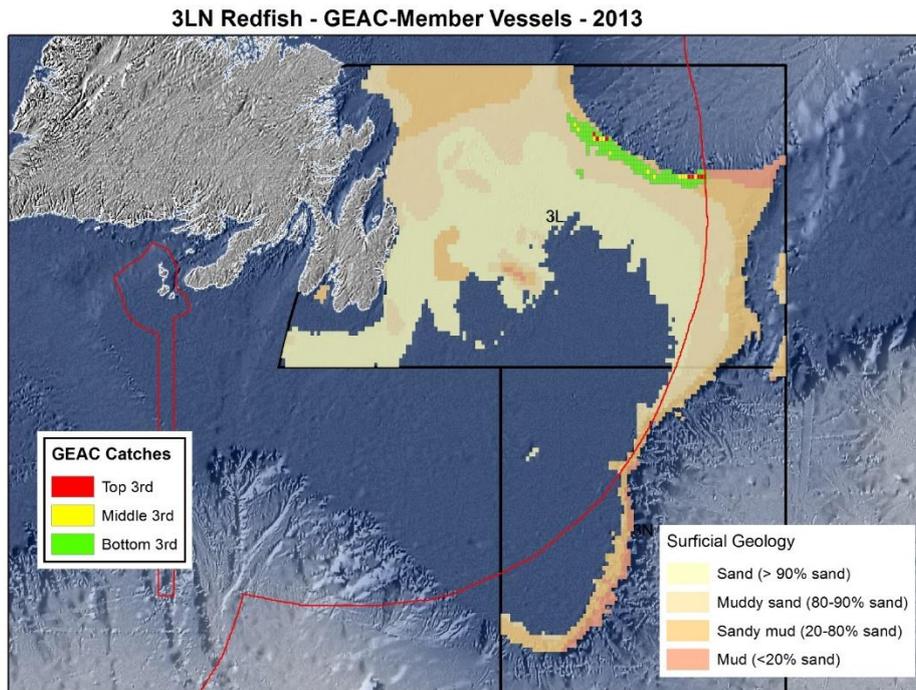


Figure 31. Footprint of the 3LN redfish bottom trawl fishery in 2013.

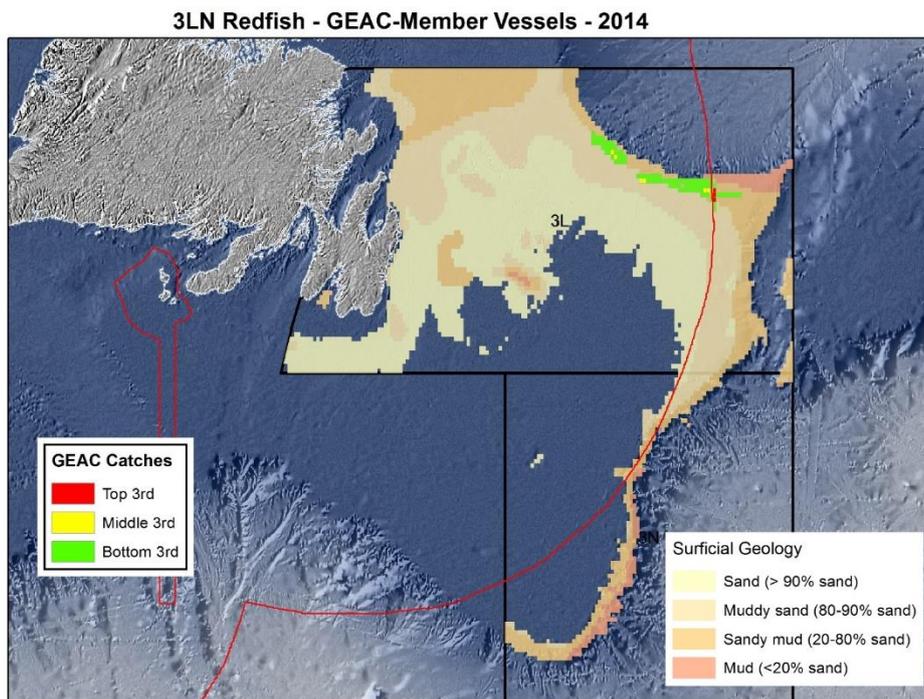


Figure 32. Footprint of the 3LN redfish bottom trawl fishery in 2014.

Vessels fish with “flying doors” (semi-pelagic doors) and elevated sweeps that are designated to lift a portion of the sweep line off the seabed allowing to reduce the impact of on the seabed.

Closed areas

The VMEs closed areas are divided into two categories, the seamount closures and the sponge, coral and seapen closures (Figure 33). As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.

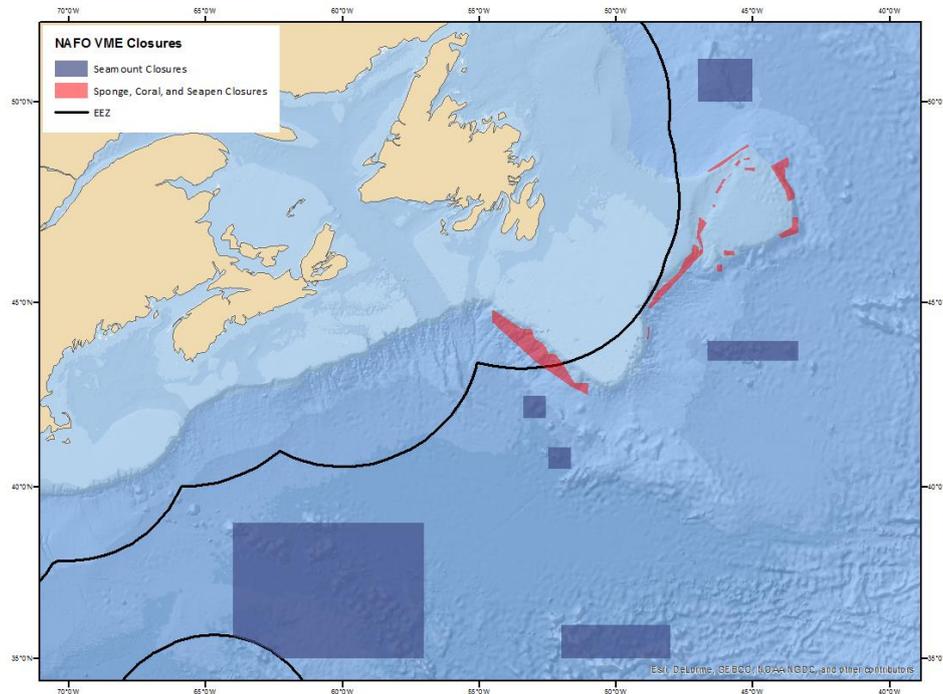


Figure 33. The VME closed areas. Source: NAFO²⁵.

The assessment team could not find any concern indicating that the 3LN redfish bottom and mid-water trawl fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, non-target 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, retained and bycatch species, and information is available to show the negligible impact on ETP species. There is no indication that the fishery causes significant serious or irreversible harm to habitats.

²⁵ https://www.nafo.int/Portals/0/Images/maps/VME_Closures.png?ver=2016-06-29-045330-217

4.5. Principle Three: Management System Background

Redfish is a straddling stock complex, i.e. it is found both inside and outside the Canadian EEZ. The 3LN redfish fishery is managed by two management systems. NAFO is responsible for the management and conservation of the fishery of the waters outside Canada EEZ. Within the Canadian EEZ, DFO is the administrative body responsible for the management of the redfish fishery.

4.5.1 The Legal Basis and Scope of the Management System

The Canadian Domestic Fishery Management System

The Canadian Constitution Act (formerly the British North America Act of 1867) gives the federal government sole authority to legislate in respect of seacoast and inland fisheries. The provincial fisheries management powers are restricted to those involving property, which have devolved into the right to manage fish once it has been landed (i.e. processing) and to manage access in non-tidal waters. Since 1867, the now mature Canadian fisheries management system has been based primarily on the extensive powers contained in what is now the Fisheries Act of Canada. This legislation gives the Minister of Fisheries and Oceans absolute authority to add or change fisheries management measures at any time (Parsons, L.S. 2009). Various fishery management regulations pertaining to fish harvesting operations are made pursuant to that Act; the principal ones being the *Fishery (General) Regulations* and the *Atlantic Fishery Regulations, 1985*.

The Coastal Fisheries Protection Act (and the regulations made under it), which apply to the activities of foreign vessels, is the other main source of the Minister's fisheries management powers. The Department's primary legislation also includes the Oceans Act, which, among other things, gives the Minister the lead authority on integrated oceans management and implementing use of the precautionary approach. The Department is also one of the three responsible authorities under the *Species at Risk Act (SARA)*.

Canada is a signatory to the United Nations Convention on Law of the Sea (UNCLOS) as well as the subsequent United Nations Fish Stocks Agreement (UNFA). It has adopted the FAO Code for Responsible Fisheries and assisted the domestic development of the Canadian Code of Conduct for Responsible Fishing operations. The Canadian Code has been ratified by some 60 Canadian fisheries organizations representing 80% of domestic landings.²⁶ Canada has also supported the four International Plans of Action (IPOA) (on seabirds, sharks, fishing capacity and illegal, unreported and unregulated fishing) that have emerged under the FAO Code.

Canada is a member of several Regional Fisheries Management Organizations (RFMO) around the world, including (but not limited to) the Northwest Atlantic Fisheries Organization (NAFO), the North Pacific Anadromous Fish Commission (NPAFC), the Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the North Atlantic Salmon Conservation Organization (NASCO) and the Western and Central Pacific Fisheries Commission (WCPFC).

Unresolved disputes within the Canadian fisheries management system can be, and have been, taken to the Canadian judicial system for a final decision. The most notable of these over the last two decades have been the "Sparrow", "Marshall" and "Larocque" decisions. The first two established aboriginal rights to fish under specific circumstances and the latter outlawed the use of resource allocations to pay for services provided to, or on behalf of, government without the approval of Parliament. The Minister's power to allocate for reasons other than conservation was also confirmed

²⁶ http://www.dfo-mpo.gc.ca/international/media/bk_fao-eng.htm

in another earlier court challenge. In recent years, there have been several other court challenges to specific resource allocation decisions (mainly in the Atlantic crab fisheries) but none have been successful except that in the case of using quota allocations to pay for services (“Larocque”). The Fisheries Act has now been amended to permit this type of quota allocation. Otherwise, the Minister’s absolute power to make allocation or access decisions cannot be fettered so long as they are made in accordance with the powers conferred by the Fisheries Act. There is provision for an appeal of licensing decisions to independent Regional and Atlantic License Appeal Boards but the Minister is not legally bound to accept recommendations made by them.

The Aboriginal and treaty rights of Canada’s First Nations in respect of the fishery are communal in nature and are recognized and affirmed by the Constitution Act, 1982. In 1990, the Supreme Court of Canada’s decision in *R. v. Sparrow* affirmed an Aboriginal right to fish for food, social and ceremonial (FSC) purposes and that this right takes priority, after conservation, over other uses of the resource. The Supreme Court also indicated the importance of consulting with Aboriginal groups when their fishing rights might be affected.

In 1999, the Supreme Court of Canada’s decision in *R. v. Marshall* affirmed a treaty right to hunt, fish and gather in pursuit of a "moderate livelihood" arising out of Peace and Friendship Treaties of 1760 and 1761. The decision affected 34 Mi’kmaq and Maliseet First Nations in the Maritimes and the Gaspé region of Québec. As a policy response to the decision, DFO negotiated fishing agreements and undertook a variety of initiatives to support the participation of these First Nations in commercial fisheries.

DFO developed and implemented a national Aboriginal Fisheries Strategy as a framework to manage the fisheries in a manner consistent with the *Sparrow* decision. The objectives of the strategy include to:

- Provide a framework for the management of fishing by Aboriginal groups for food, social and ceremonial purposes.
- Provide Aboriginal groups with an opportunity to participate in the management of fisheries, thereby improving conservation, management and enhancement of the resource.
- Contribute to the economic self-sufficiency of Aboriginal communities.
- Provide a foundation for the development of self-government agreements and treaties.
- Improve the fisheries management skills and capacity of Aboriginal groups.

DFO issues communal FSC licences based on agreements negotiated with the First Nations in which fishery allocations and collaborative management measures are identified. Communal licences are issued in accordance with the provisions of the Aboriginal Communal Fishing Licences Regulations. Aboriginal participation in the commercial fishery is communal in nature; licences are issued to a First Nation who then designates the persons and vessels authorized to fish the licences. Management measures for the communal commercial fisheries are similar to those in effect for the non-aboriginal commercial fisheries. First Nations and other Aboriginal Organizations are invited to participate in DFO’s various advisory committees and consultation processes.

Organizationally, the department’s headquarters is located in Ottawa. With few exceptions, the department’s programs and services are structured around functional “sectors” with corresponding accountabilities and authorities. Many of the programs and services are decentralized and administered in administrative Regions. The organizational structure of the department is outlined at Figure 1 below. National objectives, policies, procedures, and standards for the Department and the Canadian Coast Guard are established at national headquarters. Regions are responsible for delivering programs and activities in accordance with national and regional priorities and within prescribed national performance parameters.

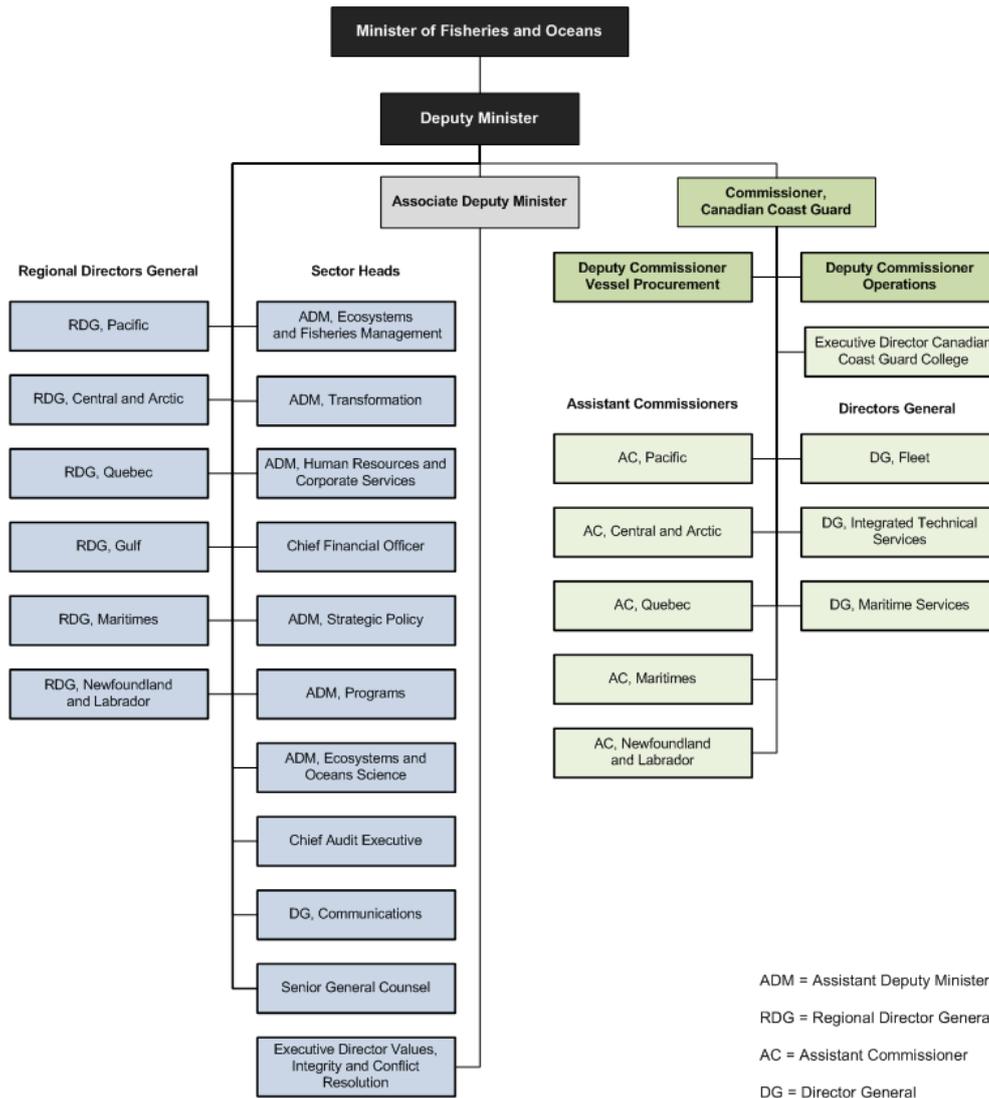


Figure 34. Schematic representation of Fisheries and Oceans Department.

For the purpose of this fishery assessment, the Canadian 3LN redfish is part of the international fishery on the overall 3LN redfish stock. The annual TACs for this stock are set by the Northwest Atlantic Fisheries Organization (NAFO) through its Fisheries Commission (FC) which also distributes allocations to eligible Contracting Parties (CP). These CPs are responsible in turn for managing their individual national fishing effort for their individual national allocations. Canada is obliged by the Article XI (Consistency of Measure/Proposals) of the NAFO Convention (NAFO 2004) to ensure consistency between its management measures for fishing inside Canadian waters and those measures established by NAFO.

The Newfoundland Region of DFO has operational responsibilities for managing Canadian fishing effort on this stock. It also has responsibility for Canada’s involvement in NAFO’s International Scheme of Joint Enforcement. There is no First Nations component, bait fishery or recreational fishery involved.

International Fishery Management System in the NW Atlantic

The Northwest Atlantic Fisheries Organization (NAFO) is the internationally established Regional Management Fisheries Organization (RFMO) that is responsible for fisheries management measures

for those fisheries that overlap with, or are completely outside, the Exclusive Economic Zone (EEZ) of the four coastal states (USA, Canada, France (in respect of St. Pierre et Miquelon), and Denmark (in respect of Faroe Islands and Greenland) in the Northwest Atlantic. NAFO was founded in 1979 through the NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic as the intergovernmental fisheries science and management body to succeed ICNAF (International Commission of the Northwest Atlantic Fisheries) (1949-1978). NAFO's overall objective is to contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the NAFO Convention Area.

The NAFO Convention Area encompasses a large portion of the North Atlantic Ocean and includes the 200-mile exclusive economic zones of coastal States jurisdiction (Canada, Denmark in respect of Greenland, France in respect of St. Pierre et Miquelon and USA). However, regulatory action by NAFO is limited to those parts of the Convention Area beyond areas of national jurisdiction. This is called the NAFO Regulatory Area (NRA). Currently NAFO has 12 Members from North America, Europe, Asia and the Caribbean. Among them are the four coastal states named above which border the Convention Area (NAFO 2015). The current 12 NAFO Contracting Parties are:

- Canada,
- Cuba,
- Denmark (in respect of the Faroe Islands and Greenland),
- European Union,
- France (in respect of Saint Pierre et Miquelon),
- Iceland,
- Japan,
- Republic of Korea,
- Norway,
- Russian Federation,
- Ukraine,
- United States of America.

The NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries applies to most fishery resources of the Northwest Atlantic except salmon, tunas/marlins, whales, and sedentary species (e.g. snow crab, lobster and various clams). NAFO management covers the following straddling stocks: cod in 3NO, redfish in 3LN and 3O, American plaice in 3LNO, yellowtail flounder in 3LNO, witch flounder in 3L and 3NO, white hake in 3NO, capelin in 3NO, skates in 3NO, Greenland halibut in 3LMNO, squid in sub-areas 3 & 4, and shrimp in 3L.

In addition, NAFO manages discrete stocks on the Flemish Cap, cod, redfish, American plaice and shrimp in the 3M zone.

NAFO also shares management with the North East Atlantic Fisheries Commission (NEAFC) of the oceanic redfish stock that is found in the Convention Areas waters of both RFMOs.

NAFO has the following organizational structure:

The Fisheries Commission (FC) is responsible for the management and conservation of the fishery resources of the Regulatory Area (waters outside the EEZs). It annually decides on the NAFO fisheries regulations, TACs and quotas (referred to as NAFO Conservation and Enforcement Measures).

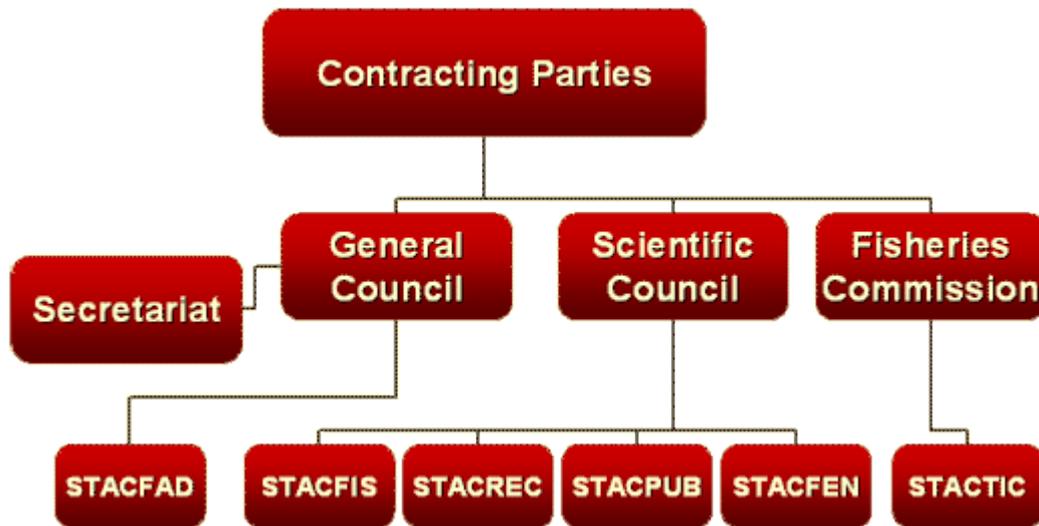
The FC has one Standing Committee: STACTIC = Standing Committee on International Control.

The Scientific Council (SC) gives advice upon request or of its own accord to the Fisheries Commission and Coastal States on the status of fish stocks in the NAFO Convention Area. Scientific Council publishes the NAFO Journal of Northwest Atlantic Fishery Science. The SC has four Standing Committees:

1. STACFIS = Standing Committee on Fisheries Science.
2. STACREC = Standing Committee on Research Coordination.
3. STACPUB = Standing Committee on Publications.
4. STACFEN = Standing Committee on Fisheries Environment

The General Council (GC) is responsible for internal affairs and external relations. The GC Chair also serves as the President of NAFO. The GC has one standing committee: STACFAD = Standing Committee on Finance and Administration.

The NAFO Secretariat is located at NAFO headquarters in Dartmouth, Nova Scotia, Canada.



4.5.2 Consultation Processes

Canada

In 2004, DFO published a departmental framework to consultations with fishing industry stakeholders and professional and to support its decision-making process. This framework was completed by a consultation toolbox to guide staff in planning and evaluating consultation processes²⁷. These tools provide for a common understanding of consultation and common approach in the consultation processes.

This Appendix C of the framework is a special section that provides guidance to DFO officials when undertaking consultations with Aboriginal groups. This guidance is consistent with the principles of the Consultation Framework, but outlines special considerations that apply with respect to consulting with Aboriginal groups. This consultation allows the aboriginal groups to be involved in decision-making process and promote more effective management of fisheries.

The main affected parties in the NL Region groundfish fishery have been variously identified since the early 1980s and participate in the DFO Newfoundland Region Groundfish Advisory Committees (2+3KL and 3Ps). The membership comprises representatives of the >100' sector, DFO, the provincial government, the FFAW/UNIFOR (fisherman/plant workers' union) and academic and invited guests. A mechanism exists whereby other members (eNGO's) are permitted to participate.

The vast majority of fishery representatives who participate in the overall Atlantic groundfish consultative processes have done so for many years, and therefore understand their individual roles and responsibilities. Formal groundfish management on the Atlantic coast through advisory committees and annual fishing plans dates back to the late 1970s/early 1980s. The roles and responsibilities of all stakeholders in the industry have been explicitly defined over the years and key areas of responsibility and interaction are now well understood.

²⁷ <http://www.dfo-mpo.gc.ca/Library/282189.pdf>

DFO has a collaborative agreement with one non-governmental organization, the World Wildlife Fund (WWF) that aims to “to achieve shared objectives for the conservation, protection, and sustainable development of Canada’s oceans, as mandated by the Oceans Act”.

Currently there are three separate IFMP covering various groundfish fisheries in the NL Region. These are 2+3KL Groundfish, 3LNO Yellowtail (YT) Flounder and 3Ps Groundfish, each with their own Advisory Committee. The NL Region has advised the Assessment Team that the various measures, objectives, strategies, policies etc contained in 2+3KL Groundfish IFMP would also apply to Canadian management approaches for its 3LN Redfish fishery. They are considering extending the coverage of that IFMP to include groundfish stocks in 3MNO. The separate IFMP for 3Ps (DFO 2014d) is said to be in place because there are different harvesters and different issues involved including a Canada/France boundary settlement aspect. The separate IFMP for 3LNO Yellowtail Flounder (DFO 2012) appears to exist because the 2+3KL IFMP was not in place in 2012.

Since the groundfish moratoria in the early 1990s, the NL Region Groundfish Advisory Committees have met on an irregular basis (as fisheries re-opened or stocks improved) only when multi-fleet management issues (e.g. quota sharing, permissible gears, seasons, areas fished) need to be addressed. There are now very few inter-fleet management issues that need continuing addressing because quota sharing arrangements or allocations keys and general fishing rules for all traditional groundfish stocks have been in place since before the 1992/93 moratoria. Meetings minutes are prepared by DFO and available to committee members when approved at the subsequent committee meeting.

In addition, various groundfish fleets are required to complete and maintain Conservation Harvesting Plans (CHPs). These include all the relevant management measures and commitments which the individual fleets are obligated to observe. These are developed and amended as necessary through bi-lateral discussions between representatives of the fleet sectors and DFO. In the case of 3LN Redfish, The Groundfish Enterprise Allocation Council (GEAC) has developed (and DFO has approved) an “evergreen” CHP (DFO/GEAC 2015) for all its groundfish EAs which incorporate all general groundfish management measures and any that are specific to 3LN Redfish such as mesh sizes and minimum fish size.

Domestic Canadian consultations on annual NAFO issues are held several times each year by the Head of the Canadian Delegation to NAFO. The first such consultative session usually is held in the first half of the year, the second after the SC June meeting and a third is held prior to the annual NAFO meeting which takes place in September. At that annual meeting Canadian delegation meetings are held as often as deemed necessary. For strategic reasons there are no publically available records of these consultative meetings.

NAFO

NAFO is a highly structured regional fishery management organization that provides a forum for consultation and decision-making on harvest levels and other management measures for stocks under its purview. Consultation among stakeholders is undertaken following a formal set of rules and procedures within its constituent bodies. The Fisheries Commission is the major consultative and decision-making forum for the management and conservation decisions on the fisheries resources managed by NAFO. It is composed of a maximum of 3 representatives of each contracting party as well as alternates, experts and advisors. Decisions on management issues are taken by FC by formal vote in those now infrequent cases where consensus cannot be reached.

Under the NAFO Rules of Procedure the Executive Secretary shall invite the following to the annual meetings of the General Council, Fisheries Commission and Scientific Council: any intergovernmental organizations that have regular contacts with NAFO on fisheries matters or whose work is of interest to NAFO as well as any non-Contracting Parties identified as harvesting fishery resources in the Regulatory Area. Non-government organizations (NGO) may attend unrestricted sessions of the annual meeting as observers upon application to the Secretariat 100 days in advance of the meeting. Such NGOs must support the general objectives of NAFO and have a demonstrated interest in the species under the purview of NAFO. If one or more contracting parties object to an applicant the matter will be put to a written vote. There are also restrictions on the activities such observers can conduct at the annual meeting. Accreditation is good for a five year period (NAFO (2015b). Representatives of the World Wildlife Fund, the Ecology Action Centre and the Sierra Club of Canada have attended annual meetings under these rules.

An annual report on the results of the Annual Meeting is prepared by the NAFO Secretariat. This report is available on the NAFO Website.²⁸

4.5.3 Long Term Objectives

Canada

The Department of Fisheries and Oceans has the lead federal role in managing Canada's fisheries and safeguarding its waters. As such it:

- supports strong economic growth in our marine and fisheries sectors by supporting exports and advancing safe maritime trade;
- supports innovation through research in expanding sectors such as aquaculture and biotechnology; and
- contributes to a clean and healthy environment and sustainable aquatic ecosystems through habitat protection, oceans management, and ecosystems research.

The Department of Fisheries and Oceans, on its Website, describes its Mission as follows (DFO 2013a): "Through sound science, forward-looking policy, and operational and service excellence, Fisheries and Oceans Canada employees work collaboratively:

"To deliver to Canadians the following outcomes:

- Economically Prosperous Maritime Sectors and Fisheries;
- Sustainable Aquatic Ecosystems;
- Safe and Secure Waters."

Its Vision is described as being "to advance sustainable aquatic ecosystems and support safe and secure Canadian waters while fostering economic prosperity across maritime sectors and fisheries."

To achieve Sustainable Fisheries and Aquaculture the Department has developed its Sustainable Fisheries Framework "to provide the basis for ensuring, Canadian fisheries are conducted in a manner which supports conservation and sustainable use. It incorporates existing fisheries management policies with new and evolving policies. The framework also includes tools to monitor and assess those initiatives geared towards ensuring an environmentally sustainable fishery, and identifies areas that may need improvement. Overall, the Sustainable Fisheries Framework provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada" (DFO 2009.)

The website outlines the Department's intention to incorporate this approach into all Integrated Fishery Management Plans: "Integrated Fisheries Management Plans identify goals related to conservation, management, enforcement, and science for individual fisheries; and they describe

²⁸ <http://www.nafo.int/publications/frames/publications.html>

access and allocations among various fish harvesters and fleet areas. The plans also incorporate biological and socio-economic considerations that are factored into harvest decisions. Integrated Fisheries Management Plans are an important reporting tool, and a valuable source of information on a given fishery for fisheries managers, industry, and other resource users. They also include a requirement to conduct a regular review of the fishery against the plan's objectives. In addition, self-diagnostic tools like the Fishery Checklist (a tool for internal use) can help the Department monitor improvements that support sustainable fisheries, and identify areas of weakness that require further work" (DFO 2009). This indicates a clear national intention to orient fisheries management practices and activities so that decisions are made in accordance with the precautionary approach and ecosystem-based management principles.

The aforementioned mission is supported by long-term strategic objectives that constitute DFO's Fisheries Renewal Initiative DFO (2013b). These objectives include:

- Long-Term Stability – enabling DFO and resource users to achieve strong conservation outcomes through risk management frameworks incorporating the ecosystem and precautionary approaches;
- Economic Prosperity – aligning fisheries policies and decision-making processes to support economically prosperous fisheries for Canadians;
- Improved Governance – increasing stability, transparency and accountability in fisheries management and by promoting shared stewardship.

The Fisheries Renewal Initiative is being implemented through current, renewed and new projects that support DFO's vision of a credible, science-based, affordable and effective fisheries program, which contributes to the sustainable wealth of Canadians.

NAFO

In Article 11 of the currently ratified NAFO Convention "The Contracting Parties agree to establish and maintain an international organization whose object shall be to contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the Convention Area." (NAFO 2004)

Resolution (1/08) of the General Council of NAFO which was adopted on 26 September 2008 (NAFO 2008) on the Interpretation and Implementation of the Convention on the Future Multilateral Cooperation in the Northwest Atlantic Fisheries outlines the organization's revised long term overall objectives:

"The Contracting Parties to the Convention on the Future Multilateral Cooperation in Northwest Atlantic Fisheries (hereinafter referred to as the Convention),

Recognizing the relevant provisions of the United Nations Convention on the Law of the Sea of 10 December 1982; the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995; the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, 1993, and

Taking into account the Code of Conduct for Responsible Fisheries adopted by the 28th Session of the Conference of the Food and Agriculture Organization of the United Nations in October 1995,

Desiring to promote the long-term conservation and optimum utilization of the fishery resources of the Northwest Atlantic Area,

Recognizing the economic and social benefits from the sustainable use of fishery resources,

Noting the amendments to the Convention adopted at the 29th annual meeting of the Northwest Atlantic Fisheries Organization (NAFO),

Declare that in giving effect to the objective of the Convention, Contracting Parties individually and collectively, intend to:

- a) adopt measures based on the best scientific evidence available to ensure that fishery resources are maintained at or restored to levels capable of producing maximum sustainable yield;
- b) apply the precautionary approach in accordance with Article 6 of the 1995 Agreement;
- c) take due account of the impact of fisheries on other species and marine ecosystems, and in doing so adopt measures to minimize harmful impacts on living marine resources and marine ecosystems;
- d) take due account of the need to preserve marine biological diversity;
- e) prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources;
- f) ensure that complete and accurate data concerning fishing activities within the Regulatory Area are collected and shared among them in a timely manner;
- g) ensure effective compliance with management measures and that sanctions for any infringements are adequate in severity; and
- h) adopt measures to prevent, deter and eliminate IUU fishing activities.”

The still to be ratified amended NAFO Convention (NAFO 2007) contains the following statement of objectives in Article II:

“The objective of this Convention is to ensure the long term conservation and sustainable use of the fishery resources in the Convention Area and, in so doing, to safeguard the marine ecosystems in which these resources are found.”

The General Principles contained in Article III commits the Contracting Parties to:

- “(a) promote the optimum utilization and long-term sustainability of fishery resources;
- (b) adopt measures based on the best scientific advice available to ensure that fishery resources are maintained at or restored to levels capable of producing maximum sustainable yield;
- (c) apply the precautionary approach in accordance with Article 6 of the 1995 Agreement;
- (d) take due account of the impact of fishing activities on other species and marine ecosystems and in doing so, adopt measures to minimize harmful impact on living resources and marine ecosystems;
- (e) take due account of the need to preserve marine biological diversity;
- (f) prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources;
- (g) ensure that complete and accurate data concerning fishing activities within the Convention Area are collected and shared among them in a timely manner;
- (h) ensure effective compliance with management measures and that sanctions for any infringements are adequate in severity; and
- (i) take due account of the need to minimize pollution and waste originating from fishing vessels as well as minimize discards, catch by lost or abandoned gear, catch of species not subject to a directed fishery and impacts on associated or dependent species, in particular endangered species”

Resolution (1/08) effectively commits CPs to follow the objectives and strategies contained in the amended Convention ahead of its full ratification.

4.5.4 Incentives for Sustainable Fishing

Canada

Objective 5.1 of the NL Region's 2+3KL Groundfish IFMP (DFO 2013c) (Stock Conservation and Ecosystem – Sustainability) specifically includes promoting the sustainable utilization of groundfish resources and cost-effective harvesting strategies that ensures compliance with management and conservation measures. The Groundfish Enterprise Allocation (EA) program in use in the Atlantic Coast groundfish fishery encourages good fishing practices, reduces the tendency to overharvesting through use of unnecessary fishing effort.

Only three fishing vessels, are currently used to fish the Canadian allocation. All catches are processed and frozen at sea and transhipped to market from one Canadian port (Bay Roberts, NL). The pace of fishing throughout the year is determined by fishing plan and marketing contracts.

A Groundfish Conservation Harvesting Plan (CHP) was re-issued to GEAC in 2015 and applies on an Atlantic-wide basis to all licensed vessels >30.48 m using mobile gear. This CHP will remain in effect until amended by DFO and the representative for this fleet. The primary objectives for the fishery are conservation. The CHP document imposes such conditions as:

- Direct only for those groundfish species specified by issued licences
- Quota reconciliation guidelines
- Minimum mesh sizes
- Bycatch provisions
- Small fish protocol
- Catch monitoring, sampling programs and survey
- Quota periods
- Juvenile spawning and other restrictions

There are no negative incentives or subsidies in the Canadian 3LN Redfish fishery. Canadian fishery legislation contains a detailed legislative penalty structure with significant financial penalties to deter negative behaviour.

NAFO

In the NAFO context, Resolution (1/08) part (f) (NAFO 2008), commits CPs to “prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources”; and part (h) requires them “to adopt measures to prevent, deter and eliminate IUU fishing activities.”

The decline in the numbers of vessels fishing annually in the NRA as documented in the annual Compliance Review report of STATIC indicates that CPs are managing the levels of fishing effort by their fleets.

4.5.5 Fishery Specific Objectives

Canada

The long-term objective of 3LN redfish Conservation Plan is to maintain the biomass in the ‘safe zone’, as defined by the NAFO Precautionary Approach framework, and at or near B_{msy} .

Currently there are three separate IFMP covering various groundfish fisheries in the NL Region. These are 2+3KL Groundfish, 3LNO Yellowtail (YT) Flounder and 3Ps Groundfish, each with its own Advisory Committee. The NL Region has advised the Assessment Team that the various measures, objectives, strategies, policies etc contained in 2+3KL Groundfish IFMP would also apply to Canadian management approaches for its 3LN Redfish fishery. They are considering extending the coverage of

that IFMP to include groundfish stocks in 3MNO. The separate IFMP for 3Ps (DFO 2014d) is said to be in place because there are different harvesters and different issues involved including a Canada/France boundary settlement aspect. The separate IFMP for 3LNO Yellowtail Flounder (DFO 2012) appears to exist because the 2+3KL IFMP was not in place in 2012.

The NL Region Groundfish IFMP for 2+3KL indicates it strives to manage groundfish stocks (and the fisheries on them) based on the following principles or long term objectives:

- Conservation and Ecosystem Considerations;
- Stewardship;
- Social, Cultural and Economic Benefits to Stakeholders; and
- Fisheries Compliance.

The IFMP then sets out a series of short-term objectives in the form of various strategies and management measures that are in place, or are in the process of being developed, “to maximize the benefit of this resource for all Canadians”.

The assessment team has been informed that DFO Newfoundland and Labrador Region is in the process of updating the IFMP for groundfish fisheries. The plan is to incorporate the 3LN redfish fishery in a revised IFMP that will be applicable to all groundfish fisheries in 2 + 3KLMNO. The target is to circulate the draft revised IFMP by the end of March 2017.

NAFO

NAFO’s 3LN redfish management plan contains short and long term objectives for stock rebuilding as well as a harvest control rule for TAC increases. These are outlined in “Development of a Risk-Based Management Strategy for 3LN Redfish (FC-SC RBMS WP 14/4 Rev 3)” which has been adopted by NAFO’s FC at the 2014 Annual Meeting. (NAFO 2014a)

The essential elements of this 3LN Redfish Management Strategy are:

1. **“Harvest Control Rule:** This HCR is designed to reach 18 100 t of annual catch by 2019-2020 through a stepwise biannual catch increase, with the same amount of increase every two years between 2015 and 2020. 18 100 t is the equilibrium yield in the 2014 assessment under the assumption of an MSY of 21 000 t.

This provides the following annual TACs:

2015: 10 400 t

2016: 10 400 t

2017: 14 200 t

2018: 14 200 t

2019: 18 100 t

2020: 18 100 t”

2. Request Scientific Council to monitor the performance of the HCR by examining the trends in the survey indices and by conducting a full assessment every 2-3 years and for the first time in 2016; and

Conduct a full review/ evaluation of the management strategy at the end of the 7 year implementation period.”

4.5.6 Decision-Making Process

Canada

There is an annual recurring domestic fishery management cycle for all species that Canada manages by quota allocations and/or annual fishery management plans on the Canadian Atlantic Coast. Data are collected through fishing log books, purchase slips, by port samplers, at-sea observers and dockside monitors while the fishery is in operation. Habitat and ecosystem information is also collected and compiled. Annual research vessel surveys are conducted to provide fishery-independent data. Early in the New Year, after the fishery has finished and all data are compiled, Stock Assessment Report (SAR) documents are prepared, peer-reviewed and shared and discussed with industry through the consultative process before final advice is developed. Approval of annual domestic TAC levels takes place at the Ministerial level. Details of fishing plan measures and the preparation and approval of CHPs takes place at the DFO Regional levels. The current CHP for 3LN Redfish is part of GEAC's "evergreen" groundfish CHP which is adjusted only as necessary in bi-lateral consultation with DFO.

This longstanding Canadian Atlantic fisheries management decision-making process has been in place since the late 1970s and groundfish operators and other interested parties are well aware of, and appear to function comfortably within, it.

NAFO

The decision making process is a little different in the case of NAFO managed stocks. Stock assessments for the next fishing year are conducted at the June meeting of the Scientific Council and the results become available to Contracting Parties. Canada holds a pre- and post- SC meeting consultation and another prior to the NAFO annual meeting. At that meeting the Fisheries Commission will decide by vote (or agree by consensus) on the TAC and associated conservation measures for the next years fishery. These FC decisions also include the level of National Allocations that are determined by the use of long established national allocation keys.

Canadian industry is then aware of their level of participation in the fishery for the upcoming year. Canadian fleet sector shares of all Canadian Atlantic groundfish species are also based on long standing allocation keys.

Annual Reports such as those of the Fisheries Commission and Scientific Council, the Annual Compliance Report and the Implementation Status of Recommendations from the NAFO Performance Assessment constitute comprehensive reporting to all interested stakeholders on research, monitoring, evaluation and review activity. These and other annual reports are readily available on the NAFO website. They appear to address the most pressing annual management issues as well as some longer term issues such as Performance Review, Amendment of the NAFO Convention and Ecosystem Science and Assessment.

4.5.7 Monitoring, Control and Surveillance

Canada

The compliance system for all Atlantic commercial fisheries consists of a range of legal and administrative sanctions, including license suspension, catch and equipment seizures and forfeitures, and monetary fines.

Enforcement measures in the 3LN Redfish fishery include:

- Air surveillance.
- Operational inspections by fishery patrol vessels of gear and vessel licence authorizations, catch on board.

- Random checks on landings by land-based DFO fisheries officers.
- Comprehensive Fishery Officer audit of data from all sources.
- Dockside monitoring of all landings.
- At-sea observers.
- Electronic Vessel Monitoring System (VMS)
- Daily reporting of position, catch and other information.
- Hail-in/out is a requirement for the start and ending of a fishing trip.

These various licensing, conservation, protection and compliance measures are contained in license conditions attached to the groundfish licence issued to eligible operators. This licence must be on board the vessel at all times.

The Canadian 3LN Redfish fishery is a re-developing fishery that re-opened for directed fishing in 2010. Currently, only three factory freezer vessels harvest the Canadian national allocation; most of the fishing is actually done by one vessel which is considered a redfish specialized platform. The frozen-at sea catches are landed at a single transshipment port under the monitoring of a Dockside Monitoring company. Transshipment to market takes place from the same port usually in very short order.

Enforcement effort directed at the NL groundfish fishery is shown on Table 12. The relatively low levels of domestic enforcement effort reflects the low levels of groundfish fishing operations because few major stocks have recovered from the 1992/93 moratoria. It also reflects the concentration of offshore enforcement on surveillance of foreign fishing activity in the NRA. (DFO 2013, 2014 and 2015)

Table 12. NL Region Groundfish Enforcement and Compliance, 2012 to 2015 (April 1 to March 31).

	2014-15	2013-14	2012-13
Patrol Activity-Domestic Groundfish			
Air Surveillance Hours	104.47	41.21	159.09
Patrol Vessel Days	2	7	2
Total Patrol Hours	880	413.5	644.5
Enforcement Action			
Charges Laid	0	0	0
Seizure of gear persons unknown	0	0	0
Warnings	0	0	0
Total Fines	0	0	0

Overall, the data indicate that domestic groundfish operations are not a major concern at this time because of the relatively low levels of fishing activity and the stringent requirements for use of VMS and catch reporting by a hail-in landing at designated ports and offloading in the presence of certified Dockside Monitors.

NAFO

The NAFO Conservation and Enforcement Measures (CEM), which are revised annually by the Fisheries Commission, contain a plethora of required actions by contracting and their vessels fishing in the NAFO Regulatory Area (NAFO 2014b). The Conservation and Enforcement Measures for 2015 constitutes a 190 page document covering such requirements as fish sizes, gear specifications, reporting requirements, Observer coverage, VMS requirements, catch reporting obligations, the Joint Inspection and Surveillance Scheme, responsibilities of Port and Flag state contracting Parties etc. The various CEMs are implemented by each contracting party. The primary avenue for enforcement in the NRA is through the Joint Inspection and Surveillance Scheme. This permits NAFO Inspectors from contracting parties to board and inspect vessels under the protocols contained in the Conservation and

Enforcement Measures. (All Contracting Parties do not deploy patrol vessels or Inspectors in the NRA.) During these inspections, citations can be issued for apparent infringements (AI); these are reported to NAFO and the respective contracting party. In the case of serious infringements the contracting party is required to recall its vessel from the NRA for further investigation at home. In such cases the contracting party is required to report to NAFO on the follow-up actions that were taken following the in-port investigation.

At each annual NAFO meeting the Fisheries Commission (through STATIC) conducts an Compliance Review based on information from the vessel monitoring system, observer reports, port inspection reports, at-sea inspection reports and reports on dispositions of apparent infringements.

The 2014 Compliance Report (NAFO 2014c) contained the following observations under General Trends:

- “Although fishing effort has steadily declined since 2004 it has stabilized at 5000 days in the NRA. Overall fishing effort declined by 13.3% in 2013 compared to the previous year. Fishing days in the NRA fell from 5510 days in 2012 to 4779 days in 2013. In contrast the number of vessels has increased by 12.3% from 57 vessels in vessel in 2012 to 64 vessels in 2013. Longline vessels fishing in the NRA have increased and have accounted for 5.2% of Groundfish operations in 2013. It can be concluded that changes in fishing activity has reduced average duration of fishing trips to the NRA.
- In the 3L shrimp fishery, although 2013 saw 7 vessels operating in the fishery in 2013, an increase from 5 vessels in 2012, the overall fishing effort has reduced a further 24% from 250 days in 2012 to 190 days in 2013.
- The re-emergence of fishing effort for the Pelagic Redfish Fishery (REB) observed in 2012 has continued but on a reduced scale. Vessel numbers operating in this fishery declined by 50%, with 4 vessels fishing in 2013 compared to 8 in 2012, and furthermore effort has been reduced by 62%, down from 210 days in 2012 to 79 days in 2013
- Observer Reports are consistently untimely and missing critical information. In 2013, only 23% of observer reports were submitted on time, a rate that has been fairly consistent for a decade. Additionally, out of 94 observer reports received, only 12 contained detailed haul-by-haul catch information. The remainder provided only trip summaries of the catch. Catch and effort on a haul by haul basis is required. Since flag State Contracting Parties are responsible for forwarding observer reports to the Secretariat, they should ensure that they are complete, consistent with Article 30, and submitted in a timely manner. The improvements made in 2014 to the observer reporting requirements should increase compliance.
- No analysis is available to determine the observer coverage rate or compliance with the reporting requirements for Contracting Parties employing the electronic reporting protocol under Article 30.B. Additional analysis is necessary to ensure that Contracting Parties are complying with minimum observer coverage levels and submitting the required reports.”

Some of the other more pertinent enforcement and compliance comments were the following:

- Based on VMS reports for 2013, closed areas are being respected.
- Based on CAT (Catch) reports the total catches reported by regulated and non regulated species can be used to identify fishing trends.
- Analysis of groundfish activity by water depth has indicated a significant increase of fishing activity in depths < 200 metres and a decrease in depths > 700 metres as compared with 2012 figures. This is consistent with increased effort in 3M Cod, 3M redfish, and a reduced effort for deep water species such as Greenland halibut.

- There has been a slight increase in effort distribution in the shallower depths. In 2012 50% of fishing effort was conducted in depths below 700 metres and in 2013 50% of fishing effort was conducted in depths below 400 metres. This suggests an increase in the targeting of species found in shallower waters such as skates, cod and redfish despite there being no increase in quota for these species. (3M cod increased TAC)
- Only two types of AI were detected at sea in 2013, and out of a total of 13 AI's 12 were associated with retaining 3M redfish after closure and 1 with the bycatch move away rule.
- Detection rate of AI's in port has increased markedly. Seven types of AI were detected in port in 2013 with a total of 16 and more than 50% of these AI's were associated with product labelling and capacity plans. This is large increase compared with 2012 which saw six types of AI's with a total of 6 cases. Prior to 2012 the last AI detected in port was in 2009.
- Contracting Parties have an obligation to resolve reported AIs. Recent resolution has been satisfactory, but there are still pending cases with no additional detail provided on their status.

Both domestically and internationally there appears to be a high level of compliance with the various regulatory requirements for 3LN redfish. This fishery is prosecuted by a small number of Canadian vessels while only three other contracting parties hold national allocations for this species in the NRA. There is no evidence of systematic non-compliance in this fishery. The NAFO website indicates “the number of citations from at-sea inspections can be used to estimate the compliance of fishing vessels with the NAFO conservation and management measures. The rate of “clean” inspection reports (i.e. the inspections that did not result in a citation) has been fairly constant since 2003, about 95% of annual the at-sea inspections performed. In 2013 only two different AI were detected.” None of these involved fishing for 3LN Redfish.

4.5.8 Research Plan

Canada

DFO's science and ocean research programs consist of numerous research initiatives to further define resource, habitat and ecosystem priorities. Their research initiatives contribute to overall information needs of fisheries management. They provide timely and reliable information that is used to sustain stocks and minimize environmental impacts from fishing.

In the case of 3LN redfish, current Canadian science work includes gathering and analysis of information on stock abundance and trends as well as age, growth, maturity, fecundity and reproductive potential. Canadian scientists have also contributed to stock delineation of redfish stocks in 3KLMNOP.

A document on 3LN Redfish Research Activities was provided to the Assessment Team during the Site Visit that constitutes the NL Region's Research Plan for activities in respect of 3LN Redfish.

The following activities represent ongoing activities of the DFO Research Program:

- Continue to conduct multispecies research surveys which provide indices for monitoring redfish population dynamics via a stock production model (ASPIC) which is the current basis for providing advice for the setting of TACs.
 - Spring DFO survey in NAFO Div. 3L and Div. 3N
 - Autumn DFO survey in NAFO Div. 3L and Div. 3N
- Continue to analyze recruitment indices and harvest rates (catch/biomass indices) to monitor population dynamics
- Continue to conduct sampling of length, sex and maturity stages as a means to develop an SSB index

- Continue to conduct genetic analysis to delineate stock structure (funding dependent).
- Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.
- Continue to analyze trends in the fish community (including redfish).
- Continue diet studies of redfish (a plank-piscivorous species) and other major groundfish species and to estimate food consumption by main predator and prey groups.
- Continue to estimate overall food consumption by the fish community.
- Continue to investigate trophic level for key species using diet composition and stable isotopes.
- Continue to investigate the development of fisheries production potential models.

Every two years or so the NAFO Scientific Council conducts a full assessment of the 3LN redfish stock with Portuguese scientists as the lead assessors. Canadian scientists contribute fishery data mainly from research vessel surveys and participate in SC and its sub-committees proceedings. This is in contrast to 3LNO yellowtail where Canadian scientists are the lead stock assessors.

NAFO

Scientific Advice for stock management is provided by the Scientific Council upon request by the Fisheries Commission for specific fish stocks within the NAFO Regulatory Area or by Coastal States who need information on stocks within their EEZs or on stocks that are straddling between two jurisdictional areas. The Scientific Council may also conduct stock assessments on its own accord and present the results to the Fisheries Commission.

The June meeting is the primary venue for assessing stocks; assessments may also be carried out at the September full NAFO meeting. The scientific advice is presented to the Fisheries Commission who develops NAFO management measures. These are reported in the Fisheries Commission's annual Conservation and Enforcement Measures. Details of all matters addressed by the Scientific Council are published in annual NAFO Scientific Council Reports. NAFO also publishes the Journal of Northwest Atlantic Fishery Science that focuses on environmental, biological, ecological and fishery aspects of living marine resources and ecosystems of the Northwest Atlantic. All these documents are available on the NAFO website.²⁹

NAFO also publishes the Journal of Northwest Atlantic Fishery Science that focuses on environmental, biological, ecological and fishery aspects of living marine resources and ecosystems of the Northwest Atlantic. All these documents are available on the NAFO website.³⁰

NAFO also organizes symposia, conferences, and scientific workshops and sponsors invited speakers to Scientific Council meetings and other scientific NAFO events. NAFO hosted the Elasmobranch Symposium (2002), a mini-Symposium on Environmental Conditions in NAFO Waters (2003), a Geostatistics Workshop (2003), and a Symposium on the Flemish Cap Ecosystem (2004).

²⁹ <http://www.nafo.int/about/frames/about.html>

³⁰ <http://www.nafo.int/about/frames/about.html>

The Annual Report of NAFO's Scientific Council lists the various scientific activities that the SC, its sub-committees and its several working groups will pursue in the coming year in respect of all fish stocks and ecosystems managed by NAFO.

4.5.9 Monitoring and Evaluation of the 3LN redfish Management System

Canada

The Newfoundland and Labrador Region of DFO conducts post-season operational reviews of its annual groundfish Enforcement initiatives internally and also in conjunction with industry members through its three Groundfish Advisory Committees. These committees now meet on an as needed basis because there are infrequent inter-fleet management issues in the currently open groundfish fisheries. The current groundfish IFMP for 2+3KL indicates that at groundfish advisory committee meeting; "a review of groundfish fisheries takes place which includes an assessment of whether these objectives are being met and key management issues are being addressed."

The NL Region has advised the Assessment Team that the various measures, objectives, strategies, policies etc in that IFMP would also apply to Canadian management approaches for its 3LN Redfish fishery. Also, they are considering extending the coverage of that IFMP to include groundfish stocks in 3MNO.

The IFMP further states: "Monitoring control and surveillance of the Fisheries will be accomplished using several tools including quota reports, IQ and EA status reports, and end-of-year quota reports that provide resource managers with hindsight into efficiency of management tools for a given year. Post season analysis sessions will be conducted with C&P and Resource Management staff to review issues encountered during the previous season and to make recommendations on improving management measures. These sessions will be conducted at the Area level and the regional level and include all sectors of DFO."

As part of this process, the information gathered through other evaluation processes like the Department's Fisheries Checklist is used to help identify areas for improvement in the management of these fisheries and through consultation with stakeholders, potential improvements are explored and priorities established. The DFO Internal Checklist referred to above is divided into three sections including target stock information, habitats/ecosystems and management systems. This checklist has been adopted and used internally by DFO as a tool to measure effectiveness of all fishery management systems (DFO 2009).

The Canadian Auditor General has the mandate to, and does, review the management of fisheries on an *ad-hoc* basis and publishes the results. The Parliament of Canada has two Committees pertaining to Fisheries and Oceans: the Standing Committee on Fisheries and Oceans of the House of Commons and the Standing Senate Committee on Fisheries and Oceans of the Senate. These standing committees regularly examine various aspects of fishery management in Canada and prepare public reports on findings and conclusions.

NAFO

All stock assessments are reviewed as part of the annual Scientific Council meetings as well as those of its Standing committees (STACFIS and STACRES). Scientists from most contracting parties contribute to and review the science data and analysis that is presented as part of each stock assessment. The stock assessment for 3LN redfish is currently conducted by Portuguese scientists using catch, fisheries surveys and sampling data supplied by Contracting Parties. This stock assessment is peer-reviewed at STACFIS and then at Scientific council who presents the results and advice to the Fisheries Commission.

This final decision-making body debates, accepts or rejects the advice and sets management measures accordingly. (The recent experience is that FC accepts advice from SC in all but a few cases.)

The presence of observers at Scientific Council and Fisheries Commission meetings does provide a level of transparency and some critical review of decisions. All Scientific Council and Fisheries Commission proceedings are published in a timely fashion on the NAFO websites.

In 2009 NAFO established a General Council Performance Assessment Working Group (PAWG) to address the establishment of a performance review to identify the strengths and weaknesses in NAFO, as urged by the United Nations General Assembly in its resolution 63/112 on Sustainable Fisheries for Regional Fishery Management Organizations (RFMOs). The General Council approved terms of reference for the Review Panel at the September 2010 Annual Meeting.

The Review Panel assessed the performance of NAFO since 1979 against the objectives set out in the NAFO Convention and other relevant international instruments on the conservation and management of marine living resources. Special emphasis was placed on the period since 1995 and the objectives reflected in the amended Convention adopted by NAFO in 2007. The criteria for reviewing the performance of NAFO can be found on the NAFO Website.

The Report of the NAFO Performance Review Panel (NAFO 2011) was presented to the 2011 Annual Meeting. A General Council Working Group on the development of plans of action necessary for the implementation of the recommendations of the NAFO Performance Review Panel was established. It was also agreed that a report on the progress in implementing the Plan of Action should become a regular agenda item on the General Council agenda. In 2012 a revised Action Plan implementation of the recommendations of the NAFO Performance Review Panel was agreed and adopted. In 2013 an Access database on the Implementation Status of Recommendations from the NAFO Performance Assessment (NAFO 2013) was developed. This can be found on the NAFO Website.

This will be a 5-year recurring review process.

5. Evaluation Procedure

5.1 Harmonised Fishery Assessment

Certification Bodies assessing fisheries that have areas of overlap are required to ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments. The CR requirements section Annex CI provides guidance for harmonisation where a fishery in assessment overlaps with an already certified fishery.

There is an Acadian redfish MSC certified, the US redfish, haddock and pollock fishery (certified in June 2016). The US Acadian redfish, pollock and haddock fishery and the Canada 3LN redfish are not considered as overlapping fisheries, and harmonization is required for none of the 3 Principles. The redfish stock in 3LN is distinct from redfish stock in the Gulf of Maine. The population structure of *S. fasciatus* appears to be characterized by the presence of 3 broad groups corresponding to three geographic areas (Valentin 2006, Valentin et al 2014). The first group comprises the Gulf of St. Lawrence – Laurentian Channel. The second group is distributed from the slope of the Grand Banks (3LNO) to the southern margin of Unit 2 (southern tip of St. Pierre Bank). The third group includes the Gulf of Maine and Nova Scotia Shelf. Overall, this southern group tends to be genetically differentiated from the northern group and from that of the Gulf of St. Lawrence – Laurentian Channel. The 2 fisheries operate in different ecosystems under different management systems.

Other Canadian Newfoundland and Labrador groundfish fisheries are certified (Table 13). Harmonization should be considered between the 3LN redfish fishery and the other Canadian fisheries with respect to Principle 3. For Principle 2, it is considered that harmonization is required only with the OCI Grand Bank yellowtail flounder as redfish UoC 1 bottom trawl and yellowtail flounder are fished in the same area by the same fishing vessels using the same fishing gear.

Table 13. Canadian Newfoundland and Labrador groundfish fisheries that are MSC certified.

Fishery name	Fishing gear	Location	MSC status
Canada/Newfoundland 3Ps cod	Towed bottom gears, demersal longline, demersal gillnet, handline	Canadian waters off the south coast of Newfoundland on NAFO division 3Ps	Certified March 2016
OCI Grand Bank (GB) Yellowtail flounder	Bottom otter trawl	Canadian waters in the Grand Bank in NAFO divisions 3LNO	Re-certified October 2015
Canada Atlantic halibut	Demersal longline, demersal trawl, gillnet, handline	Canadian waters near Newfoundland and Nova Scotia in NAFO divisions 3NOPs, 4VWX, 5Y and 5Zc	Certified in May 2013

Table 14 presents a comparison of outcomes (scores and conditions) between the Canada 3LN redfish and the 3 other Newfoundland groundfish fisheries that are within the MSC Fisheries Certification Program. A difference of 5-10 in the score has not been commented unless it resulted in a condition being set or one or more fisheries. Any difference of 15 or more in score between the 3LN redfish and another fishery is indicated.

Table 14. Principle 2 and Principle 3 scores for Newfoundland groundfish fisheries considered for harmonization with the 3LN redfish. For Principle 2, a comparison is done only between 3LN redfish UoC 1 Bottom trawl and the OCI Grand Bank yellowtail flounder. Green highlighted cells indicate where there was a difference in score of 15 or more.

PI	3LN redfish	OCI GB yellowtail flounder	Canada Atlantic halibut	Canada/Newfoundland 3Ps cod		Reason for any difference
				UoCs 1,2,3	UoC 4 (trawl)	
2.1.1	80	80				NA
2.1.2	95	100				NA
2.1.3	75	95				<p><u>3LN redfish</u> It cannot be said that sufficient data continue to be collected for the deep-water redfish as species-specific monitoring has recently started (autumn 2015).</p> <p><u>GB yellowtail flounder</u> Data on retained catch of all species are recorded in logbooks, and information is corroborated through observer records and a 100% dockside monitoring program.</p>
2.2.1	80-100	80				NA
2.2.2	80	80				NA
2.2.3	80	80				NA
2.3.1	90	90				NA
2.3.2	95	90				NA
2.3.3	80	80				NA
2.4.1	80-100	80				NA
2.4.2	85-95	85				NA
2.4.3	85-90	90				NA
2.5.1	80-100	80				NA
2.5.2	80	80				NA
2.5.3	85	85				NA
3.1.1	80	90	90	95	95	<p><u>3LN redfish</u> There is currently no formal dispute settlement mechanism available in NAFO for directly resolving such objections. The yet to be ratified Amended NAFO Convention will have a more modern international Dispute Settlement provision that should lessen the conservation impact of</p>

PI	3LN redfish	OCI GB yellowtail flounder	Canada Atlantic halibut	Canada/Newfoundland		Reason for any difference
				3Ps cod		
				UoCs 1,2,3	UoC 4 (trawl)	
						<p>Objections. The number of Objections has declined in recent years from the past. While the management system respects and observes the legal rights, it does not formally commit to such rights until they have been legally proven or established by law.</p> <p><u>3Ps cod</u></p> <p>The management system is subject to an open, transparent mechanism provided through federal legislation in open, public courts and has been tested numerous times and proven to be effective.</p> <p>The Canadian constitution and subsequent SCC judgements provide a tested and proven mechanism to formally commit to the legal rights of aboriginal peoples to fish for food and livelihood.</p>
3.1.2	95	90	80	70	70	<p><u>3LN redfish</u></p> <p>The structure, purpose and operation of the NAFO scientific and management committees are clearly outlined in the NAFO Convention and website. On the Canadian domestic groundfish management scene, the main affected parties in the NL Region groundfish fishery have been variously identified since the early 1980s and participate in the DFO Newfoundland Region's</p>

PI	3LN redfish	OCI GB yellowtail flounder	Canada Atlantic halibut	Canada/Newfoundland		Reason for any difference
				3Ps cod		
				UoCs 1,2,3	UoC 4 (trawl)	
						Groundfish Advisory Committees. <u>3Ps cod</u> No terms of reference for the 3Ps GAC, or description of its function, roles and responsibilities.
3.1.3	80	80	85	100	100	<u>3LN redfish</u> While the department's long-term objectives are consistent with MSC Principles and Criteria and the precautionary approach, Canada is subject to the type of precautionary approach for setting the 3LN Redfish TAC that is implemented by majority vote or consensus of the Fisheries Commission. Domestically it is still unclear as to the extent the PA will restrict the Minister's absolute powers under the Fisheries Act. <u>3Ps cod</u> Precautionary approach in the Ocean Act and the Sustainable Fisheries Framework clearly focuses on the incorporation of the precautionary ecosystem approaches to fishery management.
3.1.4	90	90	80	90	90	NA
3.2.1	70	90	80	80	80	<u>3LN redfish</u> The long-term objective of 3LN redfish Conservation Plan is to maintain the biomass in the 'safe zone', as defined by the NAFO Precautionary Approach framework, and at or near B_{msy} . The Conservation Plan does not include specific objectives for Principle 2.

PI	3LN redfish	OCI GB yellowtail flounder	Canada Atlantic halibut	Canada/Newfoundland		Reason for any difference
				3Ps cod		
				UoCs 1,2,3	UoC 4 (trawl)	
						There is currently no IFMP for the 3LN redfish. The NL Region advised the Assessment Team that the IFMP for 2 + 3KL groundfish fisheries objectives and management measures would also apply to the 3LN Redfish fishery. <u>Other fisheries</u> Clear fishery-specific objectives expressed by MSC's Principles 1 and 2 are explicit within the fishery's management system
3.2.2	85	90	80	90	90	NA
3.2.3	85	100	85	70	85	<u>3LN redfish</u> There is no evidence of systematic non-compliance. Both domestically and internationally there appears to be a high level of compliance with the various regulatory requirements for 3LN redfish. <u>3Ps cod</u> There appears to be evidence of systematic non-compliance in the high incidence of breach of licence condition to submit fishing logbooks on the part of some inshore fishers.
3.2.4	80	70	85	70	70	<u>3LN redfish</u> A document on 3LN Redfish Research Activities was provided to the Assessment Team during the Site Visit that constitutes the DFO's NL Region's Research Plan for science activities regarding 3LN Redfish. <u>GB yellowtail flounder</u> There is not a written document that includes a

PI	3LN redfish	OCI GB yellowtail flounder	Canada Atlantic halibut	Canada/Newfoundland 3Ps cod		Reason for any difference
				UoCs 1,2,3	UoC 4 (trawl)	
						specific research plan for the fishery. <u>3Ps cod</u> There is not a written document that includes a specific research plan for the fishery.
3.2.5	80	80	80	80	80	NA

5.2 Previous assessments

The fishery has not been previously assessed against MSC Principles and Criteria.

5.3 Assessment Methodologies

The MSC Principle and Criteria for Sustainable Fishing Standard sets out the requirements for a certified fishery. The Certification Methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Performance Indicators against which the performances of the fishery can be measured according to pre-specified guideposts. A fishery is assessed against three Principles. The default assessment tree developed by the MSC includes 31 Performance Indicators. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock belongs to; and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations.

PRINCIPLE 1: Sustainable fish stock

A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations, and for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria

- 5.1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
- 5.2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.
- 5.3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE 2: Minimizing environment impact

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.
3. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.

PRINCIPLE 3: Effective management

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principle 1 and 2, appropriate to the size and scale of the fishery.

Management system Criteria

1. The fishery shall not be conducted under controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishery-dependent communities shall be addressed as part of this process.
3. appropriate to cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedure for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary and long term interests of people dependent on fishing for food and livelihoods, in a manner consistent with ecological sustainability;
5. incorporate an appropriate mechanism for the resolution of disputes arising within the system;
6. provide economic and social incentives that contributes to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;
8. incorporate a research plan - appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interest parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;

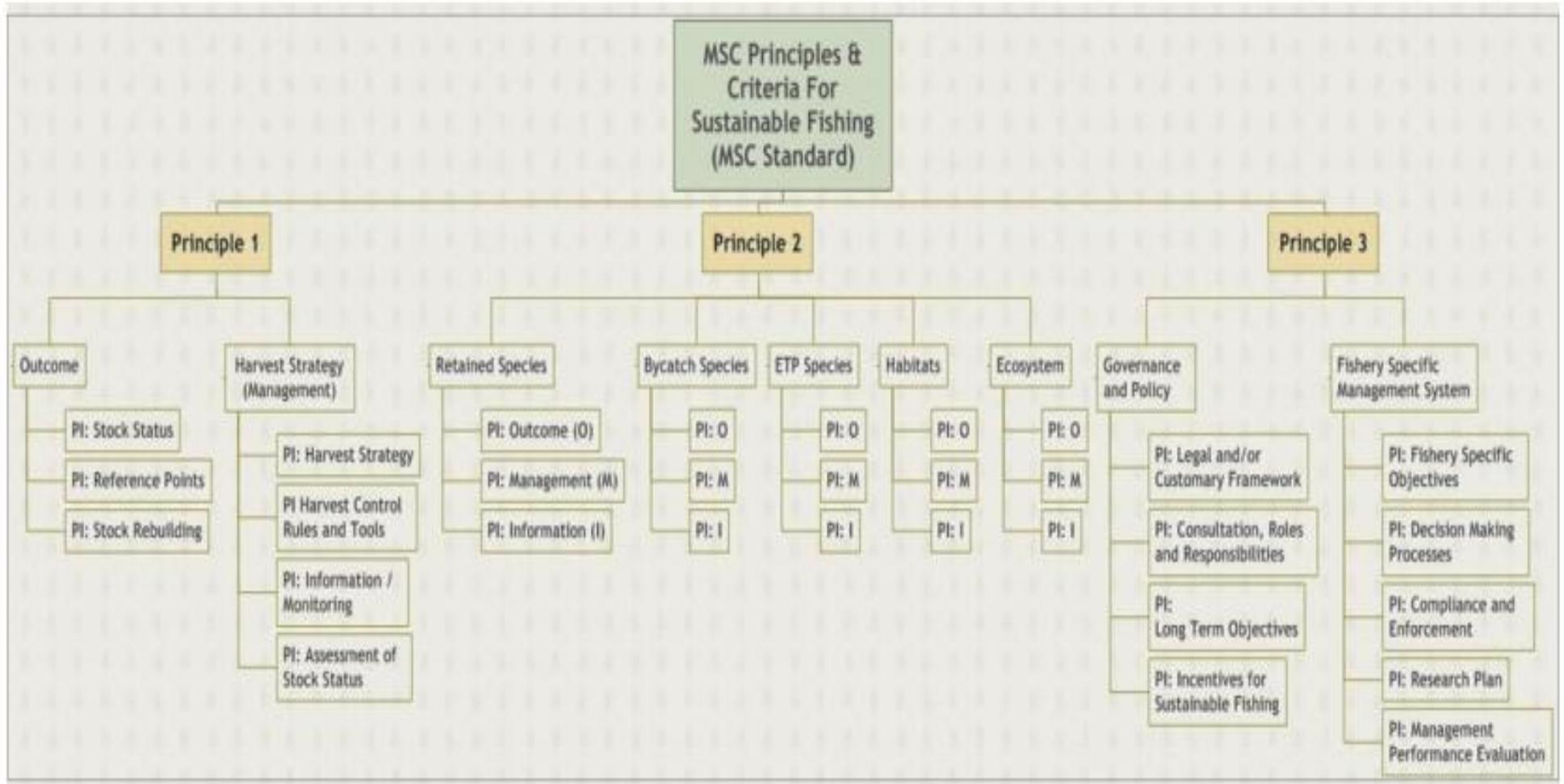
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource;
11. contains appropriate procedures to effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

Operational Criteria

Fishing operations shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical and sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

MSC Current Scheme Documents	Version
MSC Fishery Standard - Principles and Criteria for Sustainable Fishing	1.1
MSC Certification Requirements	1.3
Guidance to MSC Certification Requirements	1.3
MSC Guidance to Certification Bodies on Stakeholder Consultation in Fishery Assessment	2
MSC Full Assessment Reporting Template	1.3



5.4 Evaluation Processes and Techniques

5.4.1 Site Visit

Initial consultation meetings were held in Halifax in July 2015. The objectives of the consultation meetings were to provide information and understanding of the activities of the CAB and to discuss the fishery management organizational roles in the management of the lobster resources. The consultation meetings were designed to be inclusive of all organizations and representatives of the lobster fisheries. However, the consultation plan was designed to strategically capture sufficient information to ensure understanding and confidence with respect to full assessment scoring.

The on-site consultation also served other important functions. These included:

- Responding to questions and comments raised by participants in the fishery at this initial stage in the assessment.
- The client group provided information, documents, and a list of stakeholders as required by SAI Global. This served to allow the assessment team to collect general information on the fisheries, identify information gaps and identify key stakeholders for the information gathering exercise.
- Following the collation of general information on the fishery, a number of meetings with key stakeholders who expressed an interest to meet were scheduled by the team to fill in information gaps and to explore and discuss areas of concern.

Meetings were held in Halifax are recorded in Table 16. The assessment team could not meet face-to-face DFO, GEAC and DFA as at the time of the site visit, all flights to Newfoundland were cancelled due to bad weather conditions.

5.4.2 Consultations

Public announcements of the progression of the full assessment were made as follow:

Table 15. Stakeholder consultation process

Date	Purpose	Media
31/03/2015	Fishery enters full assessment	Notification on MSC website. Direct email/letter.
31/03/2015	Assessment Team nomination	Notification on MSC website.
14/04/2015	Assessment Team confirmation	Notification on MSC website.
28/05/2015	Use the Default Assessment Tree with principle 1 modifications	Notification on MSC website. Direct email/letter.
28/05/2015	Site Visit scheduled	Notification on MSC website. Direct email/letter.
13/08/2015 08/12/2015	Revised timeline	Notification on MSC website. Direct email/letter.
June 2016	Variation request to change in UoC, change in assessment tree and consider <i>S. mentella</i> as an IPI stock, and additional stakeholder consultation period	Notification on MSC website. Direct email/letter.

06/09/2016	Peer reviewers proposed	Notification on MSC website. Direct email/letter.
17/11/2016	Revised timeline	Notification on MSC website. Direct email/letter.
13/12/2016	Variation request and response	Notification on MSC website. Direct email/letter.
28/02/2017	Public Comment Draft Report issued	Notification on MSC website. Direct email/letter.

Table 16. Summary of consultation meetings during the July 2015 site visit.

Date	Location	Organization	Attendees	Topics discussed
21/07/2016	Halifax, NAFO offices	NAFO	SAIG assessment team ASI: Colin Brannen NAFO: Neil Campbell, Ricardo Federizon, Dayna Bell, Jana Aker	Redfish stock status, trawl annual surveys, catch reporting, observer coverage, annual compliance review, bycatch data collection, HCRs, P2 species stock status, ETP species, corals and sponges distribution and conservation measures, MPAs, NAFO objectives, decision-making processes, consultation
22/07/2016	Halifax, conference call	DFA	SAIG assessment team DFA: Tom Dooley, Sherry Glynn GEAC: Bruce Chapman	Fisheries development program, Marine Research Center, Participation to Groundfish Advisory Committee meetings, concerns, traceability
22/07/2016	Halifax, conference call	GEAC	SAIG assessment team GEAC: Bruce Chapman, Loyola Sullivan, Guðjón Þorbjörnsson	Fleet structure, fishing gear characteristics, observer program, biological samples program, dockside monitoring, Conservation Harvesting Plan, concerns about NAFO management, compliance, surveillance and monitoring, program for redfish in unit 2, research program
23/07/2016	Halifax, conference call	DFO	SAIG assessment team DFO: Brooks Pilgrim, Dave Coffin, Bob Fagan, Dawn Mercer, Brian Healey, Don Power, Nadine Wells GEAC: Bruce Chapman	Licensing, consultation, Groundfish Advisory Committee, NAFO Advisory Committee, fishery-specific objectives, decision-making processes, compliance and enforcement, performance evaluation,

Date	Location	Organization	Attendees	Topics discussed
				redfish recovery potential assessment, genetic studies on redfish, redfish separation by depth, HCRs, measures in place for bycatch species, observer coverage, ESBA areas, ETP species

5.4.3 Evaluation Techniques

Each PI under each Principle is weighted so that each of the three Principles is equal to one other.

At the Level of the Performance Indicator, the performance of the fishery is assessed as a 'score'. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. Accordingly, 100 represents a theoretically ideal level of performance and 60 a measureable shortfall.

The Scoring Guideposts (SGs) identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Performance Indicator.

The scoring methodology is fully explained in the MSC Fisheries Assessment Methodology. It can be summarized as follow:

- Scoring is a qualitative process, involving discussion between team members and arrival at a joint agreed score. Scores should be normally assigned in divisions of 5 points
- The only narrative guidance that is available is at 60, 80 and 100 SGs. Intermediate scores must therefore reflect;
 - A failure to meet all the scoring issues³¹ specified in a SG.
- The following system should then be used to determine the overall score for the PI from the scores of the different scoring issues. This system combines a primary approach based on the combination of scores achieved by the individual scoring issues (the a) to i) list below):
 - a) Score = 60: all issues meet SG60, and only SG60. Any scoring issues within a PI which fails to reach SG60, represents a failure against the MSC standard and no score shall be assigned.
 - b) 65: all issues meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
 - c) 70: all issues meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to ensure they get there.
 - d) 75: all issues meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
 - e) 80: all issues meet SG80.
 - f) 85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100.
 - g) 90: all issues meet SG80; some achieve higher performance at SG100 but some do not.

³¹ Scoring issues: The different parts of a single scoring guidepost, where more than one part exist covering related but different topics.

- h) 95: all issues meet SG80; most achieve higher performance, at SG100; only a few fail to achieve SG100.
- i) 100: all issues meet SG100

Table 17. **Weights assigned to each component and PI within the Assessment tree structure**

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle		
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	0.333	0.1667
				1.1.2	Reference points	0.5	0.25		
				1.1.3	Stock rebuilding				
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125		
				1.2.2	Harvest control rules & tools	0.25	0.125		
				1.2.3	Information & monitoring	0.25	0.125		
				1.2.4	Assessment of stock status	0.25	0.125		
		Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667
2.1.2	Management					0.333	0.0667		
2.1.3	Information					0.333	0.0667		
By-catch species	0.2			2.2.1	Outcome	0.333	0.0667		
				2.2.2	Management	0.333	0.0667		
				2.2.3	Information	0.333	0.0667		
ETP species	0.2			2.3.1	Outcome	0.333	0.0667		
				2.3.2	Management	0.333	0.0667		
				2.3.3	Information	0.333	0.0667		
Habitats	0.2			2.4.1	Outcome	0.333	0.0667		
				2.4.2	Management	0.333	0.0667		
				2.4.3	Information	0.333	0.0667		
Ecosystem	0.2			2.5.1	Outcome	0.333	0.0667		
				2.5.2	Management	0.333	0.0667		
				2.5.3	Information	0.333	0.0667		
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.25	0.125		
				3.1.2	Consultation, roles & responsibilities	0.25	0.125		
				3.1.3	Long term objectives	0.25	0.125		
				3.1.4	Incentives for sustainable fishing	0.25	0.125		
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1		
				3.2.2	Decision making processes	0.2	0.1		
				3.2.3	Compliance & enforcement	0.2	0.1		
				3.2.4	Research plan	0.2	0.1		
				3.2.5	Management performance evaluation	0.2	0.1		

6. Traceability

6.1 Eligibility Date

In accordance with CR Requirements *CR 27.6* MSC product eligibility date may be up to a maximum 6 months prior to the publication of the Public Comment Draft Report (PCDR). The client representative has indicated the client member groups desire to have the opportunity, if they so wish, to take full advantage of this 6 month period. This product may become eligible for identification with an MSC claim on eventual certification of the fishery.

The proposed target eligibility date was 31st July 2016. However, as the PCDR is published on the 28th February 2017, the revised target eligibility date is the 28th August 2016.

There is no risk of loss in the traceability, segregation and identification systems. Purchase slips and Federal logbooks contain the date of catch, the fishery and trade system can differentiate product from that sold prior to the 28th August 2016 and that sold from that date onwards.

6.2 Traceability within the Fishery

Traceability of product from the sea to the consumer is important so as to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated: Traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody. These requirements are assessed here.

- The vessels are remotely monitored with an hourly VMS at all times while fishing.
- The vessels must hail-out prior to leaving port and hail-in prior to returning to port.
- At-sea monitoring is undertaken via enforcement aircraft and vessels, and periodically by fishery observers.
- Trans-shipping of products is not permitted in the redfish fishery.
- All landings are 100% dockside monitored.
- There are no other Canadian trawl vessels outside the client group engaged in fishing for redfish in NAFO Divisions 3LN.

Currently, only three factory freezer vessels harvest the Canadian national allocation; most of the fishing is actually done by one vessel which is considered a redfish specialized platform. The frozen-at sea catches are landed at a single transshipment port under the monitoring of a Dockside Monitoring company.

There are non-Canadian trawl vessels targeting redfish in NAFO Div. 3LN. Redfish catches by other nations are presented in Table 4. There is no risk of catches made by non-Canadian vessels entering the supply chain as certified. Although it is possible that non-Canadian vessels might offload frozen-at-sea redfish and cargo ship through a bonded warehouse in a Canadian port, it is strictly done under the terms of cargo and could not be labelled as product of Canada.

It is considered that there is no opportunity for the vessels currently engaged in the 3LN redfish fishery to fish outside the UoC, and that at-sea monitoring reduces the potential for trans-shipping as far as it is possible to do so. It is confirmed that both bottom trawl (UoC 1) and mid-water trawl (UoC 2) are within the fishery under assessment and there is no possibility for other gears not covered by the UoCs to be used by any of the three vessels operating in the fishery under assessment.

6.3 Eligibility to Enter Further Chains of Custody

MSC chain of custody will need to start at the point of landing. The point of landing is where change of ownership takes place.

GEAC represents licence holders who have 96.99% of Canada's allocation. Licence holders include:

- OCI – LP2
- Quota Holdco NL Inc.
- NLIDC
- Mersey Seafoods Ltd.
- Clearwater Seafoods LP
- Harbour Grace Shrimp Co. Ltd
- MV Osprey Ltd
- Lameque Ltee

6.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock to enter further chains of custody

There are catches of non-target stocks that are IPI from the target stock. There are two species of redfish in Division 3LN, the deep-water redfish (*S. mentella*) and the Acadian redfish which have very similar external characteristics making them difficult to distinguish. Both species are fished as a stock complex, and catches are reported collectively. Therefore *S. mentella* is identified as IPI catches. The catches of *S. mentella* fulfil the requirements of MSC CR 27.4.9.1:

- a. the retained catch is indistinguishable during normal fishing operations. The two redfish species have very similar external characteristics making them extremely difficult to distinguish.
- c. the total catches of *S. mentella* do not exceed 15% by weight of the total combined catches of redfish within the unit of certification in the most recent annual fishing year. The conclusion of the fall 2015 DFO survey and the analysis of samples taken on-board fishing vessels is that the majority of the redfish biomass and the majority of the commercial fishery is comprised of *S. fasciatus*, and *S. mentella* comprises less than 10% of the catches.
- d. Redfish are not ETP species.
- e. *S. mentella* is not certified separately.

Fish and fish products coming from *S. mentella* are allowed to enter into chains of custody (A27.4.10) and the requirements for IPI stocks in Annex CH apply for *S. mentella*.

S. mentella meets the requirements CH4.2.1, CH4.2.2, and CH4.2.3:

The status of *S. mentella* relative to PRI is currently unknown, however the data are now being collected to examine this issue.

While there is no *S. mentella* specific harvest strategy in place, there is a partial strategy in place to ensure that the fishery does not hinder the recovery of deep-water redfish. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance by imposing a moratorium on targeted fishing from 1998-2008 until the fishery showed signs of recovery.

7. Evaluation Results

The 3LN redfish bottom and mid-water trawl fishery achieved a score of 80 or higher on each of the three MSC Principles independently and did not score less than 60 against any indicator. Score achieved in each Principle and for each Performance Indicator are shown in Table 18 and Table 19-20, respectively.

Although the assessment team found both UoCs in overall compliance, it also found the performance of the 3LN redfish fishery on two PIs (PI 2.1.3 Retained Species Information and PI 3.2.1 Fishery-specific objectives) to be below the established compliance mark (Table 19-20). Therefore, two conditions were attached to the fishery, which must be addressed within a specific timeframe. Full explanation of these conditions is provided in Appendix 1.3. Also, a full explanation of how the Client intends to meet these conditions is provided in the Client Action Plan in Appendix 1.3.

7.1 Principle level score

Table 18. Final Principle Scores

UoC 1 Bottom trawl

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	93.1
Principle 2 – Ecosystem	83.3
Principle 3 – Management System	83.1

UoC 2 Mid-water trawl

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	93.1
Principle 2 – Ecosystem	88
Principle 3 – Management System	83.1

7.2 Summary of Scores

Score assigned to PIs are shown in Table 19-20.

Table 19. Performance Indicators scoring assigned to the UoC 1 bottom trawl.

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	90
				1.1.2	Reference points	0.5	0.25	90
				1.1.3	Stock rebuilding	0.333	0.1667	NS
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125	100
				1.2.2	Harvest control rules & tools	0.25	0.125	100
				1.2.3	Information & monitoring	0.25	0.125	90
				1.2.4	Assessment of stock status	0.25	0.125	95
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	80
				2.1.2	Management	0.333	0.0667	95
				2.1.3	Information	0.333	0.0667	75
		By-catch species	0.2	2.2.1	Outcome	0.333	0.0667	80
				2.2.2	Management	0.333	0.0667	80
				2.2.3	Information	0.333	0.0667	80
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667	90
				2.3.2	Management	0.333	0.0667	95
				2.3.3	Information	0.333	0.0667	80
		Habitats	0.2	2.4.1	Outcome	0.333	0.0667	80
				2.4.2	Management	0.333	0.0667	85
				2.4.3	Information	0.333	0.0667	85
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667	80
				2.5.2	Management	0.333	0.0667	80
				2.5.3	Information	0.333	0.0667	85
Three	1	Governance And policy	0.5	3.1.1	Legal & customary framework	0.25	0.125	80
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	95
				3.1.3	Long term objectives	0.25	0.125	80
				3.1.4	Incentives for sustainable fishing	0.25	0.125	90
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1	70
				3.2.2	Decision making processes	0.2	0.1	85
				3.2.3	Compliance & enforcement	0.2	0.1	85
				3.2.4	Research plan	0.2	0.1	80
				3.2.5	Management performance evaluation	0.2	0.1	80

Table 20. Performance Indicators scoring assigned to the UoC 2 mid-water tra.

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	90
				1.1.2	Reference points	0.5	0.25	90
				1.1.3	Stock rebuilding	0.333	0.1667	NS
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125	100
				1.2.2	Harvest control rules & tools	0.25	0.125	100
				1.2.3	Information & monitoring	0.25	0.125	90
				1.2.4	Assessment of stock status	0.25	0.125	95
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	80
				2.1.2	Management	0.333	0.0667	95
				2.1.3	Information	0.333	0.0667	75
		By-catch species	0.2	2.2.1	Outcome	0.333	0.0667	100
				2.2.2	Management	0.333	0.0667	80
				2.2.3	Information	0.333	0.0667	80
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667	90
				2.3.2	Management	0.333	0.0667	95
				2.3.3	Information	0.333	0.0667	80
		Habitats	0.2	2.4.1	Outcome	0.333	0.0667	100
				2.4.2	Management	0.333	0.0667	95
				2.4.3	Information	0.333	0.0667	85
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667	100
				2.5.2	Management	0.333	0.0667	80
				2.5.3	Information	0.333	0.0667	85
Three	1	Governance And policy	0.5	3.1.1	Legal & customary framework	0.25	0.125	80
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	95
				3.1.3	Long term objectives	0.25	0.125	80
				3.1.4	Incentives for sustainable fishing	0.25	0.125	90
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1	70
				3.2.2	Decision making processes	0.2	0.1	85
				3.2.3	Compliance & enforcement	0.2	0.1	85
				3.2.4	Research plan	0.2	0.1	80
				3.2.5	Management performance evaluation	0.2	0.1	80

7.3 Summary of Conditions

Table 21. Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk level to deep-water redfish.	2.1.3	NA
2	The client must provide documented evidence that short and long-term objectives for the 3LN Redfish fishery have been adopted which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system.	3.2.1	NA

7.4 Certification Recommendation

On completion of the assessment and scoring process, the assessment team has *provisionally* recommended that the 3LN redfish bottom and mid-water trawl Fishery is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing.

7.5 Determination and Formal Conclusion

The Certification Committee of SAI Global has determined that:

- The **Canada 3LN Redfish Fishery** is to be awarded certification to the Marine Stewardship Council Sustainable Fishing Standard.

SAI Global hereby publicly announces its intention to certify the Fishery Unit and upon issue of a certificate, the client shall have the right to claim the fisheries as a “well managed and sustainable fishery” in accordance with the MSC Principles and Criteria for Sustainable Fishing. Fisheries material thereof is deemed eligible for entry the MSC Chain of Custody according to requirements.

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List of websites

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NAFO website

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Appendices

Appendix 1 Scoring and Rationales

Appendix 1.1 Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1

For both UoCs

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>There is a high degree of certainty that the stock is above the point where recruitment would be impaired.</p> <p>The 2016 redfish assessment, tuned with various surveys (1991-2015), indicates that redfish have increased dramatically since 1991. The 2016 assessment does not provide confidence limits around the estimates of B/B_{lim}, but the 2014 assessment indicated that as of the 2014, there is an almost 80% certainty that the biomass of the stock is greater than B_{msy} and that the point estimate of the current biomass been above for 4-5 years. The 2016 assessment indicates a further modest relative increase in stock status. The current point estimate of B_{2016}/B_{msy} is 1.389.</p> <p>There is no available quantitative basis for ascertaining the status of <i>S. fasciatus</i> independently relative to reference points. Based on the nominal survey results for the stock and, as noted above, that the ratio of <i>S. fasciatus</i> to <i>S. mentella</i> has increased it can be inferred that the biomass of <i>S. fasciatus</i> has been increasing more rapidly than the complex overall since the complex survey indices must act to average the trends over the two species. Therefore it can be reasonably inferred that the relative status of <i>S. fasciatus</i> in 2016 was likely to be higher have than that indicated for the redfish complex overall in 2016.</p> <p>The team concludes that there is a high degree of certainty that the stock is above the point where recruitment would be impaired and that the conditions for a score of SG 100 are met.</p>		
b	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing
	<p>The stock is at or fluctuating around its target reference point.</p> <p>The assessment does not provide confidence limits around the estimates of B/B_{lim}, but it indicates there is almost a 80% certainty that the biomass of the complex is greater than B_{msy} and that the point estimate of the current biomass been above B_{msy} for 4-5 years.</p> <p>There is no available quantitative basis for ascertaining the status of <i>S. fasciatus</i> independently relative to reference points. Based on the nominal survey results for the complex and that the ratio of <i>S. fasciatus</i> to <i>S. mentella</i> has increased dramatically over 25-years, it can be inferred with a high degree of certainty that the biomass of <i>S. fasciatus</i> has been increasing more rapidly than the complex since the complex index must act to average the trends over the two species. From this it can be inferred that the status of <i>S. fasciatus</i> relative to its target reference point must be significantly higher than that estimated for the complex in both the 2014 and 2016 assessments.</p> <p>While there is no direct quantitative evidence, the team infers that it is highly likely that the point estimate of <i>S. fasciatus</i> has been greater than the target reference point in recent years and therefore the stock status satisfies the conditions for a score of SG 80.</p>
References	<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p</i></p> <p>Ávila de Melo, A.M., Brites, N., Alpoim, R., González Troncoso, D., González F., and Fomin, K. 2016. A Revised Update of the 2014 ASPIC Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in Divisions 3LN. NAFO SCR Doc. 16/33. Serial No. 69 p.</p> <p>Dauphin, G., Morgan, M.J., and Shelton, P.A. 2014. Operating models for management strategy evaluations of Div. 3LN Redfish. NAFO Scientific Council Meeting – June 2014. NAFO SCR Doc. 14/040. Serial No. N6336.</p> <p>DFO. 2011. Recovery potential assessment of redfish (<i>Sebastes mentella</i> and <i>S. fasciatus</i>) in the Northwest Atlantic. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2011/044</p> <p>GEAC. 2016. 3LN redfish – Results of AFC Counts: March 31, 2016.</p> <p>DFO. 2015. Unpublished data: filename: Estimates of catches per species_depth-year_season.xls</p> <p>NAFO, 2004. Report of the NAFO Study Group on Limit Reference Points Lorient, France, 15-20 April 2004. <i>NAFO SCS Doc. 04/12, Serial Number N4980, 72 pp.</i></p> <p>NAFO. 2014. Annual Meeting – September 2004. NAFO Precautionary approach framework. NAFO/FC Doc. 04/18. Ser. No. N509.</p> <p>Ni, I-H. 1982. Meristic variation in beaked redfishes, <i>Sebastes mentella</i> and <i>S. fasciatus</i>, in the Northwest Atlantic. Can. J. Fish. Aquat. Sci. 39: 1664- 1685.</p>

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
	<p>Román E., Armesto, Á. and González-Troncoso, D., 2014. Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish Survey in the NAFO Div. 3L for the period 2003-2013. NAFO SCR Doc. 14/016, Serial Number N6310.</p> <p>Sévigny, J.-M., Méthot, R., Bourdages, H., Power, D. and Comeau, P. 2007. Review of the structure, the abundance and distribution of <i>Sebastes mentella</i> and <i>S. fasciatus</i> in Atlantic Canada in a species-at-risk context: an update DFO, Canadian Science Advisory Secretariat, Research Document 2007/085, 109 p</p>		
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Target reference point	B_{msy}	188,200 t	$1.389 * B_{msy}$ or 261,410 t
Limit reference point	From NAFO 2014 [N4980]. Given the surplus production model used in this assessment, $B_{lim} = 30\% B_{msy}$	56,460 t	$4.57 * LRP$
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 1.1.2

For both UoCs

PI 1.1.2	Limit and target reference points are appropriate for the stock		
Scoring Issue	SG 60	SG 80	SG 100
a	Guidepost Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
Met?			

PI 1.1.2		Limit and target reference points are appropriate for the stock	
	Justification	<p>Reference points are appropriate for the species and can be estimated. NAFO policy provides generic reference points. The assessment and management of Div. 3LN <i>S. fasciatus</i> uses total biomass in place of SSB, although SSB trends for the complex are shown in the assessment. The standard NAFO policy indicates target biomass is B_{msy}, B_{buf} equals 40% of unfished biomass, and B_{lim} equals 20% of unfished biomass. However, for assessments that use Schaeffer surplus models similar to that used for the 2016 and earlier Div. 3LN redfish assessments, a NAFO study group (2004) recommended using a B_{lim} of 30% B_{msy}. The reference points are, in general, consistent with international convention and represent NAFO policy. However, reference points are explicitly estimated for Div. 3LN redfish, and work by Duplisea et al. (2012) on other redfish stocks indicated that 40% B_{msy} might be more appropriate from <i>S. fasciatus</i>. The reference points in catch are calculated and presented for the stock in the assessment (TRF) or can be inferred (LRF).</p> <p>The team concludes that the reference points are appropriate, although not highly precautionary, and have been calculated for the stock therefore the SG 80 score is met.</p>	
b	Guidepost	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?	Y	N
	Justification	<p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</p> <p>As noted above, the limit biomass reference point, B_{lim}, is 30% of B_{msy}. The fishing mortality limit reference points cannot exceed F_{msy}. F_{buf} is the fishing mortality rate below F_{msy} that is only required in the absence of analyses of the probability that current or projected fishing mortality exceeds F_{lim}.</p> <p>As noted above, work on other redfish populations indicate the 40% B_{msy} might be more appropriate as an LRF. Therefore, the team concludes that the NAFO generic LRF of 30% B_{MSY} is set above the level there is an appreciable risk of impairing reproductive capacity and satisfied a score of SG 80. However, it does not fully represent a fully precautionary choice (see Duplisea et al. paper). The team also notes that the assessment does not explore the sensitivity of the assessment to alternative choices of MSY (21,000 t), which fixes productivity in the model. Therefore the fishery does not meet SG100.</p>	

PI 1.1.2		Limit and target reference points are appropriate for the stock	
c	Guidepost		<p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.</p> <p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.</p>
	Met?		Y
	Justification	<p>The target reference point is such that the stock is maintained at a level consistent with B_{msy} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.</p> <p>B_{msy} is the target reference point; therefore the conditions for SG100 score are met for the stock.</p>	
d	Guidepost		<p>For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.</p>
	Met?		Not relevant
	Justification	<p>The stock under consideration is not viewed as a key low trophic level stock.</p>	
References		<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., González Troncoso, D., González F., and Fomin, K. 2016. A Revised Update of the 2014 ASPIC Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in Divisions 3LN. NAFO SCR Doc. 16/33. Serial No. 69 p.</p> <p>DFO. 2012. Reference points for redfish (<i>Sebastes mentella</i> and <i>Sebastes fasciatus</i>) in the northwest Atlantic. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2012/004. (Duplisea and Power).</p> <p>NAFO. 2014. Redfish in Divisions 3LN. Advice June 2104 for 2015-16. SC 30 MAY-12 JUN 2-14. P.7 (one page briefing note).</p> <p>NAFO. 2004a. Report of the NAFO Study Group on Limit Reference Points Lorient, France, 15-20 April 2004. NAFO SCS Doc. 04/12, Serial Number N4980, 72 pp.</p> <p>NAFO. 2004b. Annual Meeting – September 2004. NAFO Precautionary approach framework. NAFO/FC Doc. 04/18. Ser. No. N509.</p> <p>NAFO. 2004c. Report of the NAFO Study Group on Limit Reference Points Lorient, France, 15-20 April 2004. NAFO SCS Doc. 04/12, Serial Number N4980, 72 pp</p>	

PI 1.1.2	Limit and target reference points are appropriate for the stock
OVERALL PERFORMANCE INDICATOR SCORE:	90
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 1.1.3

For both UoCs

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	NA		NA
	Justification	The assessment team did not find any evidence based on results of the current assessment or other information to suggest that the stock is consistently below the TRP or currently may be approaching the point at which recruitment is impaired.		
b	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	NA	NA	NA
	Justification	The assessment team did not find any evidence based on results of the current assessment or other information to suggest that the stock is consistently below the TRP or currently may be approaching the point at which recruitment is impaired.		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	NA	NA	

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe	
	Justification	The assessment team did not find any evidence based on results of the current assessment or other information to suggest that the stock is consistently below the TRP or currently may be approaching the point at which recruitment is impaired.	
References		<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., González Troncoso, D., González F., and Fomin, K. 2016. A Revised Update of the 2014 ASPIC Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in Divisions 3LN. NAFO SCR Doc. 16/33. Serial No. 69 p.</p> <p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions 3LN. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78</i></p>	
OVERALL PERFORMANCE INDICATOR SCORE:			NS
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 1.2.1

For both UoCs

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y
	Justification	<p>The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The current harvest strategy for Div. 3LN redfish includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments (i.e: 2012, 2014, 2016), harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation (MSE). The history of previous strategies has shown to be responsive to stock abundance by imposing a moratorium on targeted fishing from 1998-2008 until the fishery showed signs of recovery. Although the 2014 and 2016 assessment indicates that redfish and therefore <i>S. fasciatus</i> has recovered to exceed B_{msy}, and, could support the estimated MSY of 21,000 t, NAFO management selected a slow ramping-up of harvests from 10,400 in 2015 to 18,100 t by 2020, subject to results of biennial assessments. The goal is to delay a return to MSY level harvests to ensure the current upward trend is sustained and not dependent on 1-2 cohorts. This plan was reexamined in the 2016 assessment. Which indicated that that the stock would continue to be above B_{msy} through 2018, if the 2014 MSE recommendation continues to be followed.</p> <p>Note that the performance statistics used to evaluate the performance of the HCRs were:</p> <ul style="list-style-type: none"> • Low (30%) probability of exceeding F_{msy} in any year; • Very low (10%) probability of declining below B_{lim} in the next 7 years; • Less than 50% probability of declining below 80% B_{msy} in the next 7 years. <p>As noted above, NAFO recently adopted a redfish conservation plan specifically for Div. 3LN redfish, which provides specific HCRs depending on the status of the stock (NAFO 2016a).</p> <p>The overall harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points, therefore the team concludes that the harvest strategy is consistent with an SG 100 score.</p>		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	Y
	Justification	<p>The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</p> <p>The moratorium on targeted fishing imposed in 1998, apparently before the population reached the point of recruitment impairment, has apparently led to rebound in biomass. The harvest strategy combination of catch monitoring, surveys, and the frequent assessments provides the basis required to meet the objective for management of the stock. Furthermore, it has also been comprehensively tested with a recent MSE, which was re-examined in the 2016 assessment.</p> <p>The harvest strategy has been fully evaluated to explicitly address whether it would meet harvest objectives. The team concludes that conditions for the SG 100 score are met.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
	Justification	<p>Monitoring is in place that is expected to determine whether the harvest strategy is working. The stock assessment is based on a surplus production model currently tuned with four on-going annual fishery independent surveys, CPUE, and NAFO catch data. These surveys collectively appear adequate and are consistent in reflecting biomass trends. The fourth annual survey (Spanish 3L) was initiated in 2006 and was added to the assessment for the first time in the 2016 assessment. Furthermore the assessment is re-done every two years. While not used in current assessments, length and sampling is also conducted that could, in the future, support a statistical catch at length assessment as well as improve estimation of trends in spawning biomass.</p> <p>In addition to conducting assessments every 2 years (i.e. 2012, 2014, 2016), the harvest strategy was examined with an MSE in 2014 and re-examined in 2016 in the assessment. The NAFO supplementary guidance for the Div. 3LN redfish harvest strategy also includes the statement that to conduct a full review/evaluation of the management strategy on or before 2020.</p> <p>Note that the performance statistics used to evaluate the performance of the HCRs in the MSE were:</p> <ul style="list-style-type: none"> • Low (30%) probability of exceeding F_{msy} in any year; • Very low (10%) probability of declining below B_{lim} in the next 7 years; • Less than 50% probability of declining below 80% B_{msy} in the next 7 years. <p>Catches in the surveys are now being sampled to provide relative biomass of the two species (<i>S. fasciatus</i> and <i>S. mentella</i>) and therefore any deviation of the <i>S. fasciatus</i> trend from collective redfish trend will be easily identified. Furthermore, catch by species can be estimated by using bottom trawl survey ratios by depth for the commercial bottom trawl fishery.</p> <p>The current and planned monitoring is adequate to determine whether the harvest strategy is working for the stock. The capability now exists to partition survey biomass estimates and commercial catches to species and the new data could be used to improve previous survey biomass estimates. The team concludes that the scoring guidepost for this issue meets the SG60 guidepost.</p>	
d	Guidepost		The harvest strategy is periodically reviewed and improved as necessary.
	Met?		Y

Justification	<p>The harvest strategy is periodically reviewed and improved as necessary. The general performance of the fishery is evaluated regularly through the Regional Advisory Process. For example, in September 2014 (NAFO/FC Doc 14/29) recommended the Fisheries Commission requested that the Scientific Council monitor the performance of the harvest control rules for Div. 3LN redfish by examining the trends in the survey indices and by conducting a full assessment every 2-3 years and conduct a full review/evaluation of the harvest strategy on or before 2020.</p> <p>Furthermore, there is extensive evidence that elements of the harvest strategy for the stock are reviewed and improved as necessary. In the past, this has included implementation of the moratorium on directed fishing in 1998. This also includes the introduction of a fourth survey in 2006 (Spanish 3L). The assessments have been conducted every 2 years (2012, 2014, 2016), and a 2-3 year rotation is planned for the future. An MSE was conducted in 2014 and re-examined in the 2016 assessment to explore the impact of various approaches to ramping up of TACs while ensuring sustainability of the stock. Processes for estimating catch of the stock are reviewed frequently. Elements of the harvest strategy are also explored through directed scientific studies on reference points, and alternative assessment methods (i.e., length-based assessment), gear (i.e., mesh-size) effects, and genetics.</p> <p>In 2016, NAFO adopted a plan a plan for supplementary guidance specifically for Div. 3LN redfish. As noted above it specifies:</p> <ol style="list-style-type: none"> a) When biomass is below B_{lim}: <ol style="list-style-type: none"> i. No directed fishing ii. By-catch should be restricted to unavoidable by-catch in fisheries directing for other species b) When biomass is between B_{lim} and 80% of B_{msy} <ol style="list-style-type: none"> i. TAC's should be set at a level(s) to allow for growth to above 80% of B_{msy} or to avoid or mitigate further decline in biomass consistent with explicit rebuilding objectives c) When biomass is above 80% of B_{msy} <ol style="list-style-type: none"> i. TAC's should be set at a level(s) to maintain biomass above 80% of B_{msy} or to avoid or mitigate decline below 80% of B_{msy} d) If fishing mortality is above F_{msy}. Fishing mortality should be reduced to a level below F_{msy}. <p>Note that the 2016 changes now provide specific actions for a stock, which is found to be between B_{lim} and B_{buf}.</p> <p>Finally, as noted above the performance statistics used to evaluate the performance of the HCRs in the MSE were:</p> <ul style="list-style-type: none"> • Low (30%) probability of exceeding F_{msy} in any year; • Very low (10%) probability of declining below B_{lim} in the next 7 years; • Less than 50% probability of declining below 80% B_{msy} in the next 7 years. <p>Sampling in the Canadian surveys was altered in 2015 to provide samples that can be used to estimate proportions of each redfish species in the survey and provide separate indices. These will not only refine biomass trends for <i>S. fasciatus</i> but could be used to estimate the actual proportion in the commercial catches and provide</p>
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PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		<p>the basic data to ensure that trends in <i>S. mentella</i> do not confound the assessment and management of <i>S. fasciatus</i>.</p> <p>There is evidence that elements of the harvest strategy for the stock is periodically reviewed and improved as necessary therefore the team concludes that the conditions of SG 100 are met.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The target species is not a shark species therefore this issue is not scored.		
References		<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions 3LN. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p.</i></p> <p>Ávila de Melo, A.M., Brites, N., Alpoim, R., González Troncoso, D., González F., and Fomin, K. 2016. A Revised Update of the 2014 ASPIC Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in Divisions 3LN. NAFO SCR Doc. 16/33. Serial No. 69 p.</p> <p>Dauphin, G., Morgan, M.J., and Shelton, P.A. 2014. Operating models for management strategy evaluations of Div. 3LN Redfish. NAFO Scientific Council Meeting – June 2014. NAFO SCR Doc. 14/040. Serial No. N6336.</p> <p>DFO. 2012. Reference points for redfish (<i>Sebastes mentella</i> and <i>Sebastes fasciatus</i>) in the northwest Atlantic. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2012/004. .</p> <p>NAFO. 2004. Annual Meeting – September 2004. NAFO Precautionary approach framework. NAFO/FC Doc. 04/18. Ser. No. N509.</p> <p>NAFO. 2014. Scientific council meeting June meeting -2014. NAFO SCS Doc. 14/17 (Rev) Serial No. N6343</p> <p>NAFO. 2014. Part D: Scientific council Ad hoc working group on management strategies for redfish in Div. 3LN, 13 May 2014. NAFO SC 13 May 2014. 27 p.</p> <p>NAFO 2014. Risk-based management strategy for 3LN redfish. 36th Annual meeting – September 2014. NAFO/FC Doc 14/29. Ser. No. N6399</p> <p>NAFO. 2014. Risk-based management strategy for 3LN redfish. NAFO/FC Doc 14/29. Serial No. N6399.</p> <p>Pavlenko, A., and Klyuev, A. 2013. Some aspects of possible consequences after decreasing a minimal mesh size of pelagic trawls in redfish fishery in Divs. 3LN of the NAFO regulatory area. NAFA SCR.Doc. 13/020. Serial No. N6173.</p>		

PI 1.2.1	There is a robust and precautionary harvest strategy in place	
	<p>Rademeyer, R.A. and Butterworth, D.S. Statistical catch-at-length assessment of <i>S. fasciatus</i> in Unit 3. Document presented to Canadian redfish assessment review meeting, Mont Joli, 9-10 April 2014: 48pp.</p> <p>Saborido-Rey, F., Garabana, D. and Cervino, S. 2004. Age and growth of redfish (<i>Sebastes marinus</i>, <i>S. mentella</i>, and <i>S. fasciatus</i>) on the Flemish Cap (Northwest Atlantic) ICES J. Mar. Sci. 61: 231-242.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 1.2.2

For both UoCs

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	

PI 1.2.2	There are well defined and effective harvest control rules in place
Justification	<p>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>The management strategies and courses of action adopted in 2016 are defined as:</p> <p>Safe zone:</p> <ul style="list-style-type: none"> • Select and set fishing mortality from a range of values that have a very low probability of exceeding F_{lim} in a situation where stock biomass (B) has a very low probability of being below B_{lim}. In this area, target reference points are selected and set by managers based on criteria of their choosing (e.g. stable TACs; socio-economic considerations). <p>Overfishing zone:</p> <ul style="list-style-type: none"> • Reduce F to below F_{buf}. <p>Cautionary zone:</p> <ul style="list-style-type: none"> • The closer stock biomass (B) is to B_{lim}, the lower F should be below F_{buf} to ensure that there is a very low probability that biomass will decline below B_{lim} within the foreseeable future. <p>Danger zone:</p> <ul style="list-style-type: none"> • Reduce F to below F_{buf}. The closer stock biomass (B) is to B_{lim}, the lower F should be below F_{buf} to ensure that there is a very low2 probability that biomass will decline below B_{lim} within the foreseeable future3. <p>Collapse zone:</p> <ul style="list-style-type: none"> • F should be set as close to zero as possible. <p>The MSE included a performance statistic of “a. Very low (<10%) probability of declining below B_{lim} in the next 7 years.” While there is no specific harvest control rule that directly links a choice of TAC to negative change in a survey index, the combination of the frequent re-calculation of status of the stock, the NAFO PA, and adequate catch monitoring and compliance provides an adequate suite of components to ensure that exploitation rates are reduced as the stock declines in absolute and/or relative abundance. It should also be noted that based on harvest strategies in place at the time, a moratorium on directed fishing was successfully introduced from 1998-2008 in response to the complex biomass reaching low levels. The NAFO recommendations for 2015 and 2016 note that fishing mortality up to $1/3 F_{msy}$ corresponds to a catch of 10,200 t in 2015 and the assessment and MSE indicate that the biomass in 2016 has a low risk (<10%) of exceeding F_{lim}, and is projected to maintain the stock at or above B_{msy}. Fishing mortality up to $2/3 F_{msy}$ also has a low risk of exceeding F_{lim}, and maintaining the stock at or above B_{msy}. However given the uncertainties in the assessment, the NAFO recommendation was that a higher TAC only be allowed increase in a stepwise approach (every 2 years) from the current catch level. As noted above, in 2015 DFO staff prepared a Div. 3LN redbfish-explicit harvest control rule for consideration in NAFO management meetings. These, noted above, were adopted at a NAFO Joint Fisheries Commissions-Scientific Council Working Group in an April 2016 meeting. The HCRs were then adopted in the NAFO annual meeting in September 2016. Among other issues, it provides guidance if the population is below B_{lim} or between B_{lim} and 80% of B_{msy}.</p>

PI 1.2.2		There are well defined and effective harvest control rules in place	
b	Guidepost	The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?	Y	Y
	Justification	<p>The design of the harvest control rules takes into account a wide range of uncertainties.</p> <p>The current harvest control rules were tested extensively with an MSE. The elements of the MSE included:</p> <ol style="list-style-type: none"> 1. Management objectives; 2. Performance statistics; 3. Alternative management strategies; 4. Simulation evaluation of alternative management strategy performance. <p>The robustness and relative performance of these management strategies are evaluated by means of the three performance statistics used previously by NAFO (NAFO FC/SC Doc. 14/02):</p> <ol style="list-style-type: none"> 1. Low (<30%) probability of exceeding F_{msy} in any year; 2. Very low (<10%) probability of declining below B_{limit} in the next 7 years; 3. Less than 50% probability of declining below 80% B_{msy} in the next 7 years. <p>Six different operating models were used to describe the dynamic of the population while taking in account some form of uncertainty (e.g. process error, observation error)</p> <p>No sensitivity tests examined the influence of fixing the value of MSY at a value other than 21,000 t. Some runs did explore allowing the model to fit MSY, which led to unlikely scenarios, but no runs explored alternative fixed values for MSY. The authors further noted that even if 21,000 t reflected MSY during the 1960-1995 period; productivity could have changed. In neither assessment, was time varying productivity nor catchability was explored however, this would not necessarily improve the model owing to the risks of over-parameterization.</p> <p>The analyses and harvest strategy/controls do not consider the possibility of how a future increase of <i>S. mentella</i> during a <i>S. fasciatus</i> decline might negatively affect management of <i>S. fasciatus</i>. However, the addition of species sampling in the Canadian surveys will inform the process of radical changes in the species ratios.</p> <p>This MSE study showed that the stepwise increment harvest control suggested by the FC-SC WG performs well no matter what operating model is used, and therefore there is no counter-indication to use it. The harvest strategy outlined in the 2014 MSE was re-examined in the 2016 assessment where it was found that this strategy will continue to satisfy the overall harvest strategy and will continue to maintain the population above B_{msy} through 2018. The team concludes that conditions for the scoring guidepost of SG 100 is met.</p>	

PI 1.2.2		There are well defined and effective harvest control rules in place		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	Y
	Justification	<p>Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.</p> <p>The principal harvest control is the application of annual TACs for the stock based on the most recent assessments, initial MSE, and subsequent (2016) re-evaluation of the MSE. The NAFO management has shown historically the harvest controls were enacted and followed during the period of low abundance in 1998. The proposed moratorium was successfully adopted in 1998 and maintained low total bycatch (496-3,142t) from 1988-2009 until the population showed signs of recovery. The directed fishery was then reopened in 2010. With exception of 2010, when catches exceeded the TAC (4,120 t vs. 3,500 t), the total catches have been below TACs of 6,000 (2011-2012) and 6,500 in 2013. The assessment also indicates that F/F_{msy} has ranged from 0.028-0.484 for 1998-2008. The range is 0.044-0.193 in recent years (2009-2013).</p> <p>The recent MSE-re-valuation indicates that the current harvest strategy has been successful and will continue to maintain biomass above B_{msy} through 2018. There is clear evidence that the tools in use are effective in achieving the exploitation levels required under the harvest control rules. Therefore, the team concludes that conditions for SG100 are met.</p>		
References	<p>NAFO. 2014. Part D: Scientific council Ad hoc working group on management strategies for redfish in Div. 3LN, 13 May 2014. NAFO SC 13 May 2014. 27 p.</p> <p>NAFO. 2014. Report of the Fisheries Commission and Scientific Council Joint Working Group on Risk-Based Management Strategies, Halifax, Nova Scotia, Canada, 5-7 February, 2014. NAFO FC/SC Doc. 14/02, serial number 6282, 31pp.</p> <p>NAFO. 2014. Risk-based management strategy for 3LN redfish. NAFO/FC Doc 14/29. Serial No. N6399. (filename : Adopted management strategy.pdf).</p> <p>NAFO, 2016. NAFO 2016a. Report of the NAFO Joint Fisheries Commission-Scientific Council Working Group on Risk-Based Management Strategies. 4-6 April 2016. Torshavn, Faroe Islands. NAFOI Dartmouth, Nova Scotia, Canada. 2016. Serial No. N6532.</p> <p>NAFO. 2016b. Recommendations from the FC-SC Joint Working Group on Risk-based Management Strategies (WG-RBMS) to forward to FC and SC. 38th Annual Meeting – September 2016. FC-SC Working Paper 16/02. [FC agenda item 8].</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.2.3

For both UoCs

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</p> <p>Virtually all of the directed and non-directed catch is contributed by bottom trawling. The fleet composition is well known as only 3 vessels participate in the fishery.</p> <p>The team assumes that the environmental monitoring research by Canadian and other agencies of the North Atlantic is exhaustive and readily available should it be deemed necessary to explore the relationship between Div. 3LN <i>S. fasciatus</i> productivity and its environment.</p> <p>Stock structure of each redfish species in Div. 3LN has been studied extensively. A recent interpretation is that there is a single <i>S. fasciatus</i> population in Div. 3LN; but this population is not restricted to that area and likely extends further north to Div. 3K and west to Div. 3O. Information on the catch composition stock with respect to the separate redfish species is now, as of the fall of 2015, being collected routinely in the Canadian surveys. These data can now be used estimate commercial catch composition to species, further improving the accuracy of the assessments.</p> <p>The current assessment methodology which employs surplus production analysis does not require input of growth rate and maturity-at-age information or a direct estimation of productivity. There are age-at-maturity and growth estimates available for <i>S. fasciatus</i> although not necessarily estimated from specimens captured in Div. 3LN. Stock productivity could be explored or even estimated in the model, however when MSY was fitted within the 2014 assessment, the output produced highly implausible results. This led assessment authors in 2014 and 2016 to fix MSY at 21000 t, which effectively fixes productivity.</p> <p>However, the assessments have not explored the impact of varying input MSY on the output. Thus estimates of productivity generated in the model remain suspect. Furthermore, while species-specific sampling now appears to be in place, there is no attempt in the assessments and MSE to address the uncertainty that could result from fluctuation in redfish species ratios. Therefore, the assessment team concludes that SG80 is met but not SG100.</p>		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	Y
	Justification	<p>All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.</p> <p>Four current annual surveys (including the Spanish 3L survey) provide sufficient information on trends in the biomass of the stock, which in combination with catch data provide sufficiently comprehensive and precise estimates to support the current surplus production model-based assessment. This assessment in turn supports the harvest control provided the assessments are updated with the same frequency as in the past. Catch data is monitored with sufficient accuracy to support the current assessment and the harvest control rule for the stock.</p> <p>The updated sampling protocol to estimate species proportions that was introduced in the Canadian surveys in the autumn of 2015 can now be expected to improve the estimates of relative abundance of the stock both in the future and retroactively. The same data can be used to convert commercial catch of redfish to catch by species. Note that the partial separation of species by depth and space provides a theoretical basis for implementing species specific commercial catch controls on the two redfish species if required as part of the harvest control package.</p> <p>Therefore the team concludes that the conditions for SG100 are met.</p>		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	

PI 1.2.3		Relevant information is collected to support the harvest strategy	
	Justification	There is good information on all other fishery removals from the stock.	
		There is adequate information on removals of the redfish from other fisheries. There is no direct available information on catch of the two component redfish in other fisheries. However, this now can now be inferred from the depth and spatial distribution of the catches of the two species in the surveys. Should other gear types, including mid-water trawl begin to account for significant proportions of the 3LN redfish catch, the assumption of comparability in redfish species ratios with survey results may require study.	
	References	The information of removals from other fisheries is adequate to meet needs of current harvest strategy for the stock. The conditions for SG 80 are met.	
		<p>Séigny, J.-M., Méthot, R., Bourdages, H., Power, D. and Comeau, P. 2007. Review of the structure, the abundance and distribution of <i>Sebastes mentella</i> and <i>S. fasciatus</i> in Atlantic Canada in a species-at-risk context: an update DFO, Canadian Science Advisory Secretariat, Research Document 2007/085, 109 p.</p> <p>Valentin, A.E., Power, D., and Sevigny, J-M. 2015. Understanding recruitment patterns of historically strong juvenile year classes in redfish (<i>Sebastes</i> spp.): the importance of species identity, population structure, and juvenile migration. Can. J. fish. Aquat. Sci. 72:774-784.</p> <p>Valentin, A. E., Penin, X., Chanut, J., Power, D., and Sevigny, J.-M. 2014. Combining microsatellites and geometric morphometrics for the study of redfish (<i>Sebastes</i> spp.) population structure in the Northwest Atlantic. Fish. Res. 154: 102-119.</p> <p>Valentin, A.E. (personal communication).</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 1.2.4
For both UoCs

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	<p>The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The recent assessment and subsequent MSE are appropriate with respect to the harvest control role of the stock. The harvest control rule bases harvest choice on the status of the population with respect B_{msy} and F_{msy}. Both estimates are derived quantitatively in the assessment. The harvest control rule is explicitly built into the MSE as the key objective.</p> <p>The team found no evidence that the ecological importance of each component is considered, however, the team did not find any evidence to indicate this element was key at this time to the assessment and management. The new sampling to identify the relative abundance of the two redfish species in the Canadian surveys and allow more accurate survey indices and catch estimates addresses a major feature of the biology of the species that was previously ignored.</p> <p>Therefore the conditions for SG 100 are met.</p>		
b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	The assessment estimates stock status relative to reference points.		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y

PI 1.2.4		There is an adequate assessment of the stock status	
	Justification	<p>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.</p> <p>The 2014 and 2016 assessments of Div. 3LN redfish identify and examine many sources of uncertainty as they relate to the stock. These include but are not limited to:</p> <ul style="list-style-type: none"> • Various survey combinations; • Including or excluding CPUE; • Starting random number seed; • Including/excluding last year survey biomass; • Fitting <i>MSY</i>, or fixing <i>MSY</i> at 21,000 t • Retrospective analyses. <p>Included in these tests were tests of the impact of starting with pessimistic or optimistic sets of starting inputs with respect to CPUE catchability, <i>K</i>, <i>B₁/K</i>, and inflating or deflating the biomass of the last survey year. Furthermore, the planned ramp-up of harvests resulted from an examination with MSE. The assessment also takes uncertainty into account in both the assessment and subsequent MSE in a probabilistic way.</p> <p>The assessment and management does not currently account for the uncertainty that could be introduced should there be a reversal in the ratio of <i>S. fasciatus</i> to <i>S. mentella</i>, but the newly introduced species sampling in the Canadian surveys should provide notification of any significant shifts. The team concludes that it meets the conditions for SG 100.</p>	
d	Guidepost		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		Y
	Justification	<p>The assessment has been adequately tested with both a variety of sensitivity tests and model formulations (see above) and a comprehensive MSE.</p> <p>The team suggests that future assessments explore the impact of alternative values when fixing <i>B_{msy}</i> (i.e. other values than 21,000 t). Nevertheless, the team concludes that the assessment meets the conditions for a score of SG 100</p>	
e	Guidepost	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?	Y	N
	Justification	<p>The assessment of stock status is subject to peer review. The assessment of stock status is subject to peer review and meets the SG80. Discussions with NAFO staff indicated the assessments are internally reviewed by the Science council of NAFO, but the use of external reviewers is not included. The team was not able to locate a record of the review comments. The conditions of SG 100 are not met</p>	
References		<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions 3LN. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p.</i></p>	

PI 1.2.4	There is an adequate assessment of the stock status	
	<p>Ávila de Melo, A.M., Brites, N., Alpoim. R., González Troncoso, D., González F., and Fomin, K. 2016. A Revised Update of the 2014 ASPIC Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in Divisions 3LN. NAFO SCR Doc. 16/33. Serial No. 69 p.</p> <p>Dauphin, G., Morgan, M.J., and Shelton, P.A. 2014. Operating models for management strategy evaluations of Div. 3LN Redfish. NAFO Scientific Council Meeting – June 2014. NAFO SCR Doc. 14/040. Serial No. N6336.</p> <p>NAFO. 2014. Part D: Scientific council <i>Ad hoc</i> working group on management strategies for redfish in Div. 3LN, 13 May 2014. NAFO SC 13 May 2014. 27 p.</p> <p>NAFO 2014. Risk-based management strategy for 3LN redfish. 36th Annual meeting – September 2014. NAFO/FC Doc 14/29. Ser. No. N6399</p> <p>NAFO. 2014. Redfish in Divisions 3LN. Advice June 2104 for 2015-</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.1.1

For both UoCs

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N	N	N
	Justification	<p>For UoC 1 bottom trawl, main retained species are deep-water redfish, American plaice, witch flounder (2J + 3KL), cod and roundnose grenadier. For UoC 2 mid-water trawl, main retained species are deep-water redfish and witch flounder. None of the main retained species are highly likely to be within biologically based limits except the 3NO witch flounder. For both UoCs, minor species are Atlantic halibut and Greenland halibut. None of the minor species cannot be considered as meeting SG100.</p> <p><u>Main species</u></p> <p>The status of the deep-water redfish relative to PRI is currently unknown.</p> <p>The American plaice stock in 3LNO has been under moratorium since 1995, at which point the SSB was estimated to have reached an historical low point. The stock remains low compared to historic levels and, although SSB is increasing, it is still estimated to be below B_{lim}.</p> <p>2J + 3KL witch flounder is under moratorium since 1995 and bycatches in other fisheries should be kept at the lowest possible level. Although showing an increasing trend, the stock remains below B_{lim}.</p> <p>3NO cod is under moratorium since 1994 when the SSB was estimated to have reached an historic low level. The spawning biomass has increased considerably over the past five years but the 2015 estimate of 38,454 t still represents only 64% of B_{lim} (60,000 t).</p> <p>The latest stock assessment report for the 2J3KL cod concludes that the SSB from the autumn DFO RV survey increased from 19% of the LRP in 2011-2013 to 26% in 2012-2014, and although improving, remains in the critical zone.</p> <p>The roundnose grenadier is under consideration for being listed under SARA. Surveys show 98% declines in adult abundance from 1978 to 1994 and further decline from 1995 to 2003. Although much of the population lives at depths greater than those surveyed, adding uncertainty to the assessment, this is the best available information to assess the species status</p> <p>See scoring issue c below.</p>		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
		<p><u>Minor species</u> The stock assessment for Greenland halibut in subarea 2 and Division 3KLMNO is considered data limited and as such associated with a relatively high uncertainty. According to the 2014 assessment of the Atlantic halibut stock on Scotian Shelf and Southern Grand Banks, the stock is highly likely to be within biologically based limits. However, SG100 is not met as uncertainty in abundance indices, catch length composition and biological data may lead to biased estimates from the assessment model.</p>		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points are not defined for all retained species, preventing the fishery from meeting SG100.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	

Justification	<p>There is a partial strategy in place to ensure that both UoCs do not hinder the recovery of deep-water redfish. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance by imposing a moratorium on targeted fishing from 1998-2008.</p> <p>There is a partial strategy in place to ensure that the fishery does not hinder the recovery of American plaice. A Conservation Plan, Rebuilding Strategy and HCR are in place. As per licence condition for groundfish:</p> <ol style="list-style-type: none"> 1) the licence holder/operator is required to forthwith return to the place from which it was taken and, where alive, in a manner that causes the least harm any American plaice less than 20 cm in length when fishing outside Div. 4VWX5. 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1,250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of American plaice less than 0.5 % of the total catch.</p> <p>There is a partial strategy in place to ensure that the fishery does not hinder the recovery of 2J + 3KL witch flounder. As per licence condition for groundfish:</p> <ol style="list-style-type: none"> 1) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1,250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of witch flounder less than 1 % of the total catch.</p> <p>There is a partial strategy in place to ensure that the fishery does not hinder the recovery of cod. As per licence condition for groundfish:</p> <ol style="list-style-type: none"> 1) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species 2) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of cod less than 0.5 % of the total catch.</p> <p>There is a partial strategy in place to ensure that the fishery does not hinder the recovery of grenadier. As per licence condition for groundfish, incidental catch for each trip shall not exceed 5% of the weight of the authorized directed species. The 3LN redfish fishery complies with the licence conditions with a total bycatch of grenadier less than 0.5 % of the total catch.</p>
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PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species	
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.	
	Met?	Y	
	Justification	The status of the deep-water redfish is poorly known. However there are measures in place that are expected to result in the fishery not hindering the recovery. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance by imposing a moratorium on targeted fishing from 1998-2008.	
References		<p>Cox, S.P., Benson, A., and den Heyer, C.E. 2016. Framework for the Assessment of Atlantic Halibut Stocks on the Scotian Shelf and Southern Grand Banks. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/001. v + 57 p.</p> <p>DFO. 2015. Northern (NAFO Divs. 2J3KL) Cod Stock Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/018.</p> <p>DFO/GEAC 2015 "Conservation Harvesting Plan (CHP,) Atlantic-Wide Licence Holders For Vessels, Greater Than 30.48m Loa".</p> <p>NAFO 2015. Witch flounder in Division 3NO. Advice June 2015. SC 29 May – June 2015.</p> <p>NAFO 2016. American Plaice in Division 3LNO. Advice June 2016 for 2017-2018. SC 03 – June 2016.</p> <p>NAFO 2016. Witch flounder in Division 2J + 3KL. Advice June 2016 for 2017-2019. SC 03 – June 2016.</p> <p>Greenland halibut in SA 2 + Div. 3KLMNO https://www.nafo.int/Portals/0/PDFs/Species/Greenland%20halibut.pdf?ver=2016-08-08-100130-010</p> <p>Grenadier http://www.sararegistry.gc.ca/virtual_sara/files/public/cd-roundnosegrenadierroche-0115_e.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.1.2

For both UoCs

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y

Justification	<p>There is a strategy in place for managing retained species.</p> <p>There is a strategy in place to ensure that both UoCs do not hinder the recovery of deep-water redfish. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance by imposing a moratorium on targeted fishing from 1998-2008. Also monitoring is now in place to evaluate the abundance trend of both redfish species.</p> <p>There is a strategy in place to ensure that the fishery does not hinder the recovery of American plaice. A Conservation Plan, Rebuilding Strategy and HCR are in place. As per licence condition for groundfish:</p> <ul style="list-style-type: none"> 3) the licence holder/operator is required to forthwith return to the place from which it was taken and, where alive, in a manner that causes the least harm any American plaice less than 20 cm in length when fishing outside Div. 4VWX5. 4) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1,250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of American plaice less than 0.5 % of the total catch.</p> <p>There is a strategy in place to ensure that the fishery does not hinder the recovery of witch flounder. As per licence condition for groundfish:</p> <ul style="list-style-type: none"> 3) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species 4) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1,250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of witch flounder less than 1 % of the total catch.</p> <p>There is a strategy in place to ensure that the fishery does not hinder the recovery of cod. As per licence condition for groundfish:</p> <ul style="list-style-type: none"> 3) In Area 2 and Div 3K, incidental catch shall not exceed 10% per haul by weight of the authorized directed species per incidentally caught species 4) In Div. 3LNO, incidental catch shall not exceed 5% per haul by weight of the authorized directed species per incidentally caught species and the total incidental catch on board for the trip shall not exceed 1250 kg or 5%, whichever is the greater. <p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of cod less than 0.5 % of the total catch.</p> <p>There is a partial strategy in place to ensure that the fishery does not hinder the recovery of grenadier. As per licence condition for groundfish, incidental catch for each trip shall not exceed 5% of the weight of the authorized directed species.</p>
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PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
		<p>The 3LN redfish fishery complies with the licence conditions with a total bycatch of grenadier less than 0.5 % of the total catch.</p> <p>There is a strategy to manage all retained species as the 3LN redfish fleets operates under specific bycatch allowances (minor species are subject to a bycatch limit of 5% or 10% of the total catch depending of the stock). Also Atlantic halibut less than 81 cm must be returned to the sea. Moreover the cod end mesh size is 155 mm which allows non-marketable size of individuals of any species to escape.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y except for deep-water redfish
	Justification	<p>Testing supports high confidence that the strategy will work for all retained species except for deep-water redfish. Catch are monitored and data are available to show that catches are low and well below the incidental catch allowance. A stock assessment is carried out for most main retained species, and the most recent results show that although still below B_{lim} stocks show an increasing trend, and Atlantic halibut is highly likely to be within biologically based limits. Although there are no sign of population recovery for the grenadier in Canadian waters, there is a low overlapping between the redfish fishing effort spatial distribution and the grenadier distribution. The species is most abundant at depths 400-1,200 m whereas 50% of the redfish fishery occurs at less than 400 m and 70% at less than 500 m.</p> <p>There is some objective basis for confidence that the partial strategy will work for deep-water redfish. The current harvest strategy for the Div. 3LN redfish complex includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring (five current annual surveys), biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation. The history of previous harvest strategies have shown to be responsive to stock complex abundance. The recent monitoring of the species composition showed that catches of deep-water redfish are less than 10% of the total catch. However the assessment team considers that a Y cannot be assigned for SG100 as the monitoring of the species composition has been recently implemented.</p>		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y except for deep-water redfish

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Justification	<p>There is clear evidence that the strategy is being implemented successfully for all retained species except for deep-water redfish. The redfish fishery is subject to 100% dockside monitoring providing evidence that strategies in place to manage retained species are successfully implemented. Data show that landings of all retained species are well below the incidental catch allowances.</p> <p>There is some evidence that the partial strategy is being implemented successfully for deep-water redfish. A monitoring of the species composition in both commercial catches and DFO RV has been implemented, and shows that catches of deep-water redfish are less than 10% of the total catch. The history of previous harvest strategies have shown to be responsive to stock complex abundance. However the assessment team considers that a Y cannot be assigned for SG100 as the monitoring of the species composition has been recently implemented.</p>		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	<p>There is some evidence that strategies is achieving its overall objectives based on the very low levels of retained species that are well below the incidental bycatch allowance. Moreover, most of main bycatch species that have been determined to be below B_{lim} have stocks showing an increasing trend and fishing mortality is currently low. For deep-water redfish, the history of previous harvest strategies have shown to be responsive to stock complex abundance. And Atlantic halibut is highly likely to be within biologically based limits. Although there are no sign of population recovery for the grenadier in Canadian waters, there is a low overlapping between the redfish fishing effort spatial distribution and the grenadier distribution. The species is most abundant at depths 400-1,200 m whereas 50% of the redfish fishery occurs at less than 400 m and 70% at less than 500 m.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		<p>Cox, S.P., Benson, A., and den Heyer, C.E. 2016. Framework for the Assessment of Atlantic Halibut Stocks on the Scotian Shelf and Southern Grand Banks. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/001. v + 57 p.</p> <p>DFO. 2015. Northern (NAFO Divs. 2J3KL) Cod Stock Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/018.</p>		

PI 2.1.2	There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species	
	<p>DFO/GEAC 2015 "Conservation Harvesting Plan (CHP,) Atlantic-Wide Licence Holders For Vessels, Greater Than 30.48m Loa".</p> <p>NAFO 2015. Witch flounder in Division 3NO. Advice June 2015. SC 29 May – June 2015.</p> <p>NAFO 2016. American Plaice in Division 3LNO. Advice June 2016 for 2017-2018. SC 03 – June 2016.</p> <p>NAFO 2016. Witch flounder in Division 2J + 3KL. Advice June 2016 for 2017-2019. SC 03 – June 2016.</p> <p>Greenland halibut in SA 2 + Div. 3KLMNO https://www.nafo.int/Portals/0/PDFs/Species/Greenland%20halibut.pdf?ver=2016-08-08-100130-010</p> <p>Grenadier http://www.sararegistry.gc.ca/virtual_sara/files/public/cd-roundnosegrenadierroche-0115_e.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:	95 (taking into account that 100 b and c is not met for the deep-water redfish)	
CONDITION NUMBER (if relevant):	NA	

Evaluation Table for PI 2.1.3

For both UoCs

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N for deep-water redfish, grenadier and Greenland halibut
	Justification	<p>Accurate and verifiable information on catch of all retained species and the consequence for the status of affected populations is available except for deep-water redfish, grenadier and Greenland halibut.</p> <p>Each vessel in the directed redfish fishery must keep logs of each tow. These log entries record for each tow, the start and end time, depth, latitude/longitude at start and end, NAFO division, type of gear used, the mesh size of the gear, and the mandatory reporting of catch by species in kilograms round weight.</p> <p>The tow by tow information gathered on-board the vessel is summarized and relayed to on-shore management, who then completes a daily Hail report which is then relayed to DFO each day. The observed trip coverage for 2013 and 2014 were 36% and 67% respectively. Further, the redfish fishery is also subject to 100% dockside monitoring, providing further quantifiable evidence.</p> <p>The deep water redfish and the Acadian redfish which have very similar external characteristics making them difficult to distinguish. Although sampling to distinguish the two species have been taken on-board fishing vessels during 2015 autumn, catches are reported collectively. The 2015 DFO fall survey and sampling in commercial catches show that deep-water redfish account for approximately 10% of redfish catches. However the monitoring has been implemented to recently for the species to meet SG100.</p> <p>The stock assessment for Greenland halibut in subarea 2 and Division 3KLMNO is considered data limited and as such associated with a relatively high uncertainty. Surveys show 98% declines in grenadier adult abundance from 1978 to 1994 and further decline from 1995 to 2003. Although much of the population lives at depths greater than those surveyed, adding uncertainty to the assessment, this is the best available information to assess the grenadier status.</p>		
b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N for deep-water redfish, grenadier, Greenland halibut and Atlantic halibut.

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification	<p>For all retained species, except for deep-water redfish and grenadier, Greenland halibut and Atlantic halibut, it is considered that the information is sufficient to quantitatively estimate the outcome status with a high degree of certainty.</p> <p>The deep water redfish and the Acadian redfish which have very similar external characteristics making them difficult to distinguish. Both species are fished, managed and assessed as a stock complex, and catches are reported collectively. Surveys show 98% declines in grenadier adult abundance from 1978 to 1994 and further decline from 1995 to 2003. Although much of the population lives at depths greater than those surveyed, adding uncertainty to the assessment, this is the best available information to assess the grenadier status. The stock assessment for Greenland halibut in subarea 2 and Division 3KLMNO is considered data limited and as such associated with a relatively high uncertainty.</p> <p>According to the 2014 assessment of the Atlantic halibut stock on Scotian Shelf and Southern Grand Banks, the stock is highly likely to be within biologically based limits. However, SG100 is not met as uncertainty in abundance indices, catch length composition and biological data may lead to biased estimates from the assessment model.</p>		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N for deep-water redfish
	Justification	<p>Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective, except for deep-water redfish.</p> <p>The observed trip coverage for 2013 and 2014 were 36% and 67% respectively. Further, the redfish fishery is also subject to 100% dockside monitoring, providing further quantifiable evidence.</p> <p>The deep water redfish and the Acadian redfish which have very similar external characteristics making them difficult to distinguish. Both species are fished as a stock complex, and catches are reported collectively. The 2015 DFO fall survey and sampling in commercial catches show that deep-water redfish account for approximately 10% of redfish catches. As this monitoring has recently been implemented, it cannot be said that the information is adequate to evaluate with a high degree of certainty whether the strategy is achieving its objectives yet, SG80 being met but not SG100.</p>		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
	Met?	N for deep-water redfish	N for deep-water redfish
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk level to all main retained species except for deep-water redfish.</p> <p>Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species except for deep-water redfish species.</p> <p>The redfish species-specific monitoring is now in place in the DFO fall survey and in sampling of commercial catches. However, given its recent implementation (autumn 2015) it cannot be said that sufficient data continue to be collected to detect any increase in risk level.</p> <p>In addition, the assessment team makes a recommendation that the client provides up-to-date retained species information if this gear starts to be used.</p>	
	References	<p>Landings data provided during site visit</p> <p>Cox, S.P., Benson, A., and den Heyer, C.E. 2016. Framework for the Assessment of Atlantic Halibut Stocks on the Scotian Shelf and Southern Grand Banks. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/001. v + 57 p.</p> <p>DFO. 2015. Northern (NAFO Divs. 2J3KL) Cod Stock Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/018.</p> <p>NAFO 2015. Witch flounder in Division 3NO. Advice June 2015. SC 29 May – June 2015.</p> <p>NAFO 2016. American Plaice in Division 3LNO. Advice June 2016 for 2017-2018. SC 03 – June 2016.</p> <p>NAFO 2016. Witch flounder in Division 2J + 3KL. Advice June 2016 for 2017-2019. SC 03 – June 2016.</p> <p>Greenland halibut in SA 2 + Div. 3KLMNO https://www.nafo.int/Portals/0/PDFs/Species/Greenland%20halibut.pdf?ver=2016-08-08-100130-010</p> <p>Grenadier http://www.sararegistry.gc.ca/virtual_sara/files/public/cd-roundnosegrenadierroche-0115_e.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			75
CONDITION NUMBER (if relevant):			1

Evaluation Table for PI 2.2.1

For UoC 1 bottom trawl

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	N	N
	Justification	<p>Bycatches are very low in the 3LN redfish bottom trawl fishery. None of the species accounts for more than 0.5% of the total catch.</p> <p>According to DFO and client met during the site visit, the main shark species caught in the redfish bottom trawl fishery is blue shark (<i>Prionace glauca</i>). The assessment team considers the blue shark as main bycatch species due to its vulnerability. Population abundance in the North Atlantic appears to have decreased modestly since 1984. There is no fishery-independent index of abundance for blue shark in Canadian waters. The averaged ICCAT index for the North Atlantic shows no marked trend in relative abundance between 1958 and 1994, with a decline thereafter. The net decline since 1958 was approximately 20-30%. A population model based on the CPUE indices indicated that biomass in 2010 remained above biomass at maximum sustainable yield (B_{msy}) and that no overfishing was occurring, although the ICCAT report further acknowledged that the population model was highly uncertain, preventing the fishery from meeting SG80 for blue shark.</p> <p>The most recent information available on the status of skate species that are likely to be taken by the redfish fishery indicates that populations are relatively healthy.</p> <p>A score of 100 cannot be awarded because it is not possible to say with a high degree of certainty that all the bycatch species are within biologically based limits.</p>		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	This is a partial strategy to ensure that the fishery does not hinder the recovery of the blue shark. The fishing operation and characteristics of the fishing gears act as a partial strategy. Bycatch of blue shark is very low and almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines.		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.	
	Met?	Y	
	Justification	<p>The main bycatch species is the blue shark. There is no fishery-independent index of abundance for blue shark in Canadian waters. The averaged ICCAT index for the North Atlantic shows no marked trend in relative abundance between 1958 and 1994, with a decline thereafter. The net decline since 1958 was approximately 20-30%. A population model based on the CPUE indices indicated that biomass in 2010 remained above biomass at maximum sustainable yield (B_{msy}) and that no overfishing was occurring, although the ICCAT report further acknowledged that the population model was highly uncertain.</p> <p>This is a partial strategy to ensure that the fishery does not hinder the recovery of the blue shark. The fishing operation and characteristics of the fishing gears act as a partial strategy. Bycatch of blue shark is very low and almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines.</p>	
References		<p>Observers records</p> <p>Campana, S.E., Fowler, M., Houlihan, D., Joyce, W., Showell, M., Miri, C., and Simpson, M. 2015. Current Status and Threats to the North Atlantic Blue Shark (<i>Prionace glauca</i>) Population in Atlantic Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/026. v + 44 p.</p> <p>COSEWIC 2005. "COSEWIC Assessment and Status Report on the Winter Skate <i>Leucoraja Ocellata</i> in Canada." <i>Committee on the Status of Endangered Wildlife in Canada</i> Ottawa: vii + 41.</p> <p>DFO 2013. "Proceedings of the Zonal Advisory Process for Smooth Skate and Thorny Skate PreCOSEWIC Meeting, January 11-13, 2011." <i>Can. Sci. Advis. Sec. Proceed. Ser.</i> 2012/035: vi + 38.</p> <p>Simpson, M.R., L.G.S. Mello, C. Miri, M.M. Treble, and T. Siferd. 2011. "A Pre-COSEWIC Assessment of Thorny Skate (<i>Amblyraja Radiata</i> Donovan, 1808) on the Grand Bank, Newfoundland Shelf, Labrador and Northern Waters." <i>Can. Sci. Adv. Sec. Res. Doc.</i> 2011/</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.2.1

For UoC 2 mid-water trawl

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	Y
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery, then SG 100 is met (CB3.8.3).		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery, then SG 100 is met (CB3.8.3).		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery, then SG 100 is met (CB3.8.3).	
References		Observers records	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.2.2

For UoC 1 bottom trawl

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	The main bycatch species is the blue shark. This is a partial strategy to ensure that the fishery does not hinder the recovery of the blue shark. The fishing operation and characteristics of the fishing gears act as a partial strategy. Bycatch of blue shark is very low and almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines. Moreover the cod end mesh size is 155 mm which allows non-marketable size of individuals of any species to escape. The fishery does not meet SG100 as a full strategy would require to monitor bycatch at the species level which is not currently the case.		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. Bycatch of blue shark is very low and almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines. The fishery does not meet SG100 as a full strategy is not in place. A full strategy would require to monitor bycatch at the species level which is not currently the case.		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.
	Met?		Y
	Justification	<p>There is clear evidence that the strategy is being implemented successfully.</p> <p>There is some evidence that the partial strategy is being implemented successfully. Bycatch of blue shark is very low and almost all mortality can be attributed to hooking and post-release mortality in pelagic longlines. Canadian sources of blue shark mortality remain a small percentage of total (international) mortality to the North Atlantic population, and the fishing-related mortality in Canadian waters appear to be sustainable.</p> <p>The fishery does not meet SG100 as a full strategy is not in place. A full strategy would require to monitor bycatch at the species level which is not currently the case.</p>	
d	Guidepost		There is some evidence that the strategy is achieving its overall objective.
	Met?		N
	Justification	<p>Although there is evidence that the partial strategy is achieving its objective of managing and minimizing the bycatch levels, the fishery does not meet SG100 as a full strategy is not in place. A full strategy would require to monitor bycatch at the species level which is not currently the case.</p>	
References		<p>Observers records</p> <p>Campana, S.E., Fowler, M., Houlihan, D., Joyce, W., Showell, M., Miri, C., and Simpson, M. 2015. Current Status and Threats to the North Atlantic Blue Shark (<i>Prionace glauca</i>) Population in Atlantic Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/026. v + 44 p.</p> <p>Román E., Armesto, Á. and González-Troncoso, D., 2014. Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish Survey in the NAFO Div. 3L for the period 2003-2013. NAFO SCR Doc. 14/016, Serial Number N6310.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.2.2

For UoC 2 mid-water trawl

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species. The assessment team considers that the level and composition of bycatch species would be similar if the mid-water trawl would be used nowadays, the fishery meeting the SG80. But the assessment team considers that the fishery does not meet SG100 as this gear is not currently used, so it cannot be said that a full strategy is in place.		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species. The assessment team considers that the level and composition of bycatch species would be similar if the mid-water trawl would be used nowadays, the fishery meeting the SG80. But the assessment team considers that the fishery does not meet SG100 as this gear is not currently used, so it cannot be said that a full strategy is in place.		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.
	Met?		Y
	Justification	<p>There is clear evidence that the strategy is being implemented successfully.</p> <p>Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999.</p> <p>Based on the observer records, there are no bycatch species. The assessment team considers that the level and composition of bycatch species would be similar if the mid-water trawl would be used nowadays, the fishery meeting the SG80.</p> <p>But the assessment team considers that the fishery does not meet SG100 as this gear is not currently used, so it cannot be said that a full strategy is in place.</p>	
d	Guidepost		There is some evidence that the strategy is achieving its overall objective.
	Met?		N
	Justification	<p>Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999.</p> <p>Based on the observer records, there are no bycatch species. The assessment team considers that the level and composition of bycatch species would be similar if the mid-water trawl would be used nowadays, the fishery meeting the SG80.</p> <p>But the assessment team considers that the fishery does not meet SG100 as this gear is not currently used, so it cannot be said that a full strategy is in place.</p>	
References		Observers records	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.2.3

UoC 1 bottom trawl

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery. The main bycatch species is blue shark. Shark bycatch represents 0.16% and 0.1% of total catch in 2013 and 2014, respectively. The fishery does not meet SG100 as some bycatch are not identified at the species level.		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Information is sufficient to estimate outcome status with respect to biologically based limits. The main bycatch species is blue shark. Shark bycatch represents 0.16% and 0.1% of total catch in 2013 and 2014, respectively. There is no fishery-independent index of abundance for blue shark in Canadian waters. The averaged ICCAT index for the North Atlantic shows no marked trend in relative abundance between 1958 and 1994, with a decline thereafter. The net decline since 1958 was approximately 20-30%. A population model based on the CPUE indices indicated that biomass in 2010 remained above biomass at maximum sustainable yield (Bmsy) and that no overfishing was occurring, although the ICCAT report further acknowledged that the population model was highly uncertain. The fishery does not meet SG100 as some bycatch are not identified at the species level, and stock status is not available for all bycatch species.		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
	Justification	<p>Information is adequate to support a partial strategy to manage main bycatch species. The main bycatch species is blue shark. Shark bycatch represents 0.16% and 0.1% of total catch in 2013 and 2014, respectively.</p> <p>There is no fishery-independent index of abundance for blue shark in Canadian waters. The averaged ICCAT index for the North Atlantic shows no marked trend in relative abundance between 1958 and 1994, with a decline thereafter. The net decline since 1958 was approximately 20-30%. A population model based on the CPUE indices indicated that biomass in 2010 remained above biomass at maximum sustainable yield (B_{msy}) and that no overfishing was occurring, although the ICCAT report further acknowledged that the population model was highly uncertain.</p> <p>The fishery does not meet SG100 as some bycatch are not identified at the species level.</p>	
d	Guidepost		<p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>
	Met?		<p>Y</p> <p>N</p>
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species. Blue shark has been identified as the only main bycatch species. Information on bycatch are from the vessel logbook and observers.</p> <p>The fishery does not meet SG100 as some bycatch are not identified at the species level.</p>	
References		<p>Observers records</p> <p>Campana, S.E., Fowler, M., Houlihan, D., Joyce, W., Showell, M., Miri, C., and Simpson, M. 2015. Current Status and Threats to the North Atlantic Blue Shark (<i>Prionace glauca</i>) Population in Atlantic Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/026. v + 44 p.</p> <p>Román E., Armesto, Á. and González-Troncoso, D., 2014. Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish Survey in the NAFO Div. 3L for the period 2003-2013. NAFO SCR Doc. 14/016, Serial Number N6310.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

UoC 2 mid-water trawl

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Mid-water trawl is not currently used by the fishery under assessment but was used before the moratorium. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery. The assessment team considers that the level and composition of bycatch species would be similar if the mid-water trawl would be used nowadays. However, this gear is not currently used, so there is no up-to-date bycatch information to confirm that the level and composition of bycatch is similar to what it was, preventing the fishery from meeting SG100.		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Information is sufficient to estimate outcome status with respect to biologically based limits. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery. However, this gear is not currently used, so there is no up-to-date bycatch information to confirm that the level and composition of bycatch is similar to what it was, preventing the fishery from meeting SG100.		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
	Justification	Information is sufficient to estimate outcome status with respect to biologically based limits. Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery. However, this gear is not currently used, so there is no up-to-date bycatch information to confirm that the level and composition of bycatch is similar to what it was, preventing the fishery from meeting SG100.	
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy). Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y N
	Justification	Bycatch species information is available for 1988, 1989, 1990, 1992 and 1999. Based on the observer records, there are no bycatch species in the fishery. Although this gear is not currently used, so up to date bycatch information is not available. However, the team is confident that this data would be available if the gear was used as the catch monitoring requirements, including vessel logbook and observer coverage, are the same for all mobile gears targeting groundfish in Div. 3LN. Therefore, the assessment team concludes that the fishery meets SG80 but not SG100. However, the assessment team makes a recommendation that the client provides up-to-date bycatch information if this gear starts to be used.	
References		Observers records.	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.3.1

For both UoCs

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species		
		The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	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.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	<p>According to MSC (CB3.11.1), ETP species are defined as those that are recognised by national legislation and those that are listed in Appendix 1 of CITES. Species that appear exclusively on non-binding list such as IUCN Red List or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP species under MSC standards.</p> <p>Northern wolffish, spotted wolffish, striped wolffish, the leatherback turtle and whale species that may occur in the area where the fishery is prosecuted are listed under SARA. SARA listing requires that the release of the species upon capture. Interactions with ETP species are required to be recorded in the vessel logbook and by observers.</p> <p>There were no reported and observed catches of leatherback turtle and marine mammals in the Canada 3LN redfish bottom and mid-water trawl fisheries. Wolffish catches are very low and account for less than 0.5% of the total catch of bottom trawl. There were no wolffish catches recorded for the mid-water trawl. Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species. The fishery meeting SG80.</p> <p>Specific information on post-release survival would be needed in order to support the meeting of SG100.</p>		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species	
		The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species	
	Justification	<p>Direct effects are highly unlikely to create unacceptable impacts to ETP species. There were no reported and observed catches of leatherback turtle in the Canada 3LN redfish bottom and mid-water trawl fisheries.</p> <p>There have been no reports of interactions between both redfish bottom and mid-water trawl fisheries.</p> <p>Wolffish catches are very low and account for less than 0.5% of the total catch of bottom trawl. There were no wolffish catches recorded for the mid-water trawl.</p> <p>Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species. Moreover, a recent slight increase of most wolffish species have been observed in DFO annual research surveys. The fishery meets SG80.</p> <p>Specific information on post-release survival would be needed in order to support the meeting of SG100.</p>	
c	Guidepost		<p>Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.</p> <p>There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.</p>
	Met?		<p>Y</p> <p>Y</p>
	Justification	<p>No indirect effects on ETP species are known to exist in the fishery. Furthermore, the interaction between the fishery and ETP species is considered to be very low.</p>	
References		<p>Observers records and data form logbooks</p> <p>DFO. 2013. Wolffish in the Atlantic and Arctic regions. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/005.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.3.2

For both UoCs

PI 2.3.2		<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y
	Justification	<p>There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species. In Canada the primary management strategies for the protection of ETP species are provided by SARA. Once protected under SARA, ETP species are subject to recovery strategies and management plan.</p> <p>Under the <i>SARA</i>, a recovery strategy has been implemented for the Northern wolffish and the spotted wolffish. Under the <i>SARA</i>, a recovery strategy has been implemented for the leatherback turtle and whale species.</p> <p>Interactions with ETP species are required to be recorded in the vessel logbook and by observers.</p> <p>SARA listing requires that the release of the species upon capture. In support of this, DFO has issued a Tips for handling and releasing wolffish which is distributed to vessel crew members.</p> <p>The level of interaction with ETP species is very low. The catch of wolffish represents less than 0.5% of total catch and no interaction with leatherback turtle and marine mammals have been recorded.</p> <p>Based on all the above, the fishery meets the SG100.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N

PI 2.3.2	<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 			
	Justification	<p>There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.</p> <p>The strategy to manage the impacts on ETP species is focused on wolffish and is consistent with the recovery strategy for northern and spotted wolffish. The level of interaction with ETP species is very low. The catch of wolffish represents less than 0.5% of total catch and no interaction with leatherback turtle and marine mammals have been recorded.</p> <p>Specific information on post-release survival would be needed in order to support the meeting of SG100.</p>		
c	Guidepost		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	<p>There is evidence that the strategy is being implemented successfully. The wolffish recovery strategy has been implemented, and DFO has reported on the progress of implementation.</p> <p>DFO has issued a Tips for handling and releasing wolffish which is distributed to vessel crew members.</p> <p>The strategy to manage the impacts on ETP species is focused on wolffish and is consistent with the recovery strategy for northern and spotted wolffish. The level of interaction with ETP species is very low. The catch of wolffish represents less than 0.5% of total catch and no interaction with leatherback turtle and marine mammals have been recorded.</p>		
d	Guidepost			There is evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	<p>There is evidence that the strategy is achieving its objective.</p> <p>The level of interaction with ETP species is very low. The catch of wolffish represents less than 0.5% of total catch and no interaction with leatherback turtle and marine mammals have been recorded.</p> <p>The last DFO Science Advisory Report was for wolffish in the Atlantic and Arctic regions was published in 2013. In recent years, there was a very gradual increase in catch rates of Northern wolffish during the DFO spring research survey in Div. 3LNO, and during the fall survey in Div. 2J3K and Div. 3LN. In recent years, during the DFO fall research survey in Div. 2J3K and Div. 3LNO, catch rates of Spotted wolffish were generally increasing.</p>		
References	<p>Observers records and data form logbooks</p> <p>DFO Groundfish fishing licence for vessel greater that 30.48 m LOA using fixed gear or mobile gear.</p>			

PI 2.3.2	<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 	
	<p>DFO Tips for handling and releasing wolffish – Otter trawl fishery.</p> <p>DFO. 2013. Wolffish in the Atlantic and Arctic regions. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/005.</p> <p>Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolffish (<i>Anarhichas denticulatus</i>) and Spotted Wolffish (<i>Anarhichas minor</i>), and Management Plan for Atlantic Wolffish (<i>Anarhichas lupus</i>) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.3.3

For both UoCs

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. Interactions with ETP species are required to be recorded in the vessel logbook and by observers. There were no reported and observed catches of leatherback turtle in the Canada 3LN redfish bottom and mid-water trawl fisheries. There have been no reports of interactions between both redfish bottom and mid-water trawl fisheries. Wolffish catches are very low and account for less than 0.5% of the total catch of bottom trawl. There were no wolffish catches recorded for the mid-water trawl. Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species. Specific information on post-release survival would be needed in order to support the meeting of SG100.		
b	Guidepost	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N

PI 2.3.3	<p>Relevant information is collected to support the management of fishery impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 			
	Justification	<p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.</p> <p>Interactions with ETP species are required to be recorded in the vessel logbook and by observers.</p> <p>There were no reported and observed catches of leatherback turtle in the Canada 3LN redfish bottom and mid-water trawl fisheries.</p> <p>There have been no reports of interactions between both redfish bottom and mid-water trawl fisheries.</p> <p>Wolffish catches are very low and account for less than 0.5% of the total catch of bottom trawl. There were no wolffish catches recorded for the mid-water trawl.</p> <p>Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species. Specific information on post-release survival would be needed in order to support the meeting of SG100. Moreover, impacts, mortalities and injuries to ETP species may go unobserved on the seabed or in the water column, or because of strikes on the trawl wires, and it is therefore not possible to say that accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries.</p>		
c	Guidepost	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p>
	Met?	Y	Y	N
	Justification	<p>Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.</p> <p>Interactions with ETP species are required to be recorded in the vessel logbook and by observers.</p> <p>There were no reported and observed catches of leatherback turtle in the Canada 3LN redfish bottom and mid-water trawl fisheries.</p> <p>There have been no reports of interactions between both redfish bottom and mid-water trawl fisheries.</p> <p>Wolffish catches are very low and account for less than 0.5% of the total catch of bottom trawl. There were no wolffish catches recorded for the mid-water trawl.</p> <p>Wolffish abundance trends are extensively monitored through DFO annual trawl surveys.</p> <p>Although post-release survival studies on wolffish have not been undertaken, according to observers, high survival rates are observed for these species. Specific information on post-release survival would be needed in order to support the meeting of SG100. Moreover, impacts, mortalities and injuries to ETP species may go unobserved on the seabed or in the water column, or because of strikes on the trawl wires, and it is therefore not possible to say that accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries.</p>		

PI 2.3.3	<p>Relevant information is collected to support the management of fishery impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
References	<p>Observers records and data form logbooks</p> <p>DFO. 2013. Wolffish in the Atlantic and Arctic regions. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/005.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.4.1

For UoC 1 bottom trawl

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	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.
	Met?	Y	Y	N
	Justification	<p>The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>A study of direct trawling impacts was conducted on the northern part of the Grand Bank, in an area of relatively stable sand in deeper water than is typically fished for redfish. The immediate, visible impacts included damage to biogenic structures such as tubes, burrows and mounds, the creation of trawl tracks and the destruction of epibenthic and shallow burrowing infauna. Nevertheless, the study concluded that the rich macrobenthic community in this area had recovered fully within one year after intensive fishing.</p> <p>The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014. The study shows that most of the fishing activity occurs on muddy sand and sandy mud bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM² area (3LN within 100-900 meter depth) was swept on an annual basis. More realistic estimates based primarily on footgear impact suggest that only 0.1% of the total sea area is swept on an annual basis.</p> <p>There are no areas of significant sponge concentrations in the 3LN redfish habitat area. There is potential overlap with respect to two designated areas of coral concentrations. With one exception, virtually all of the fishing effort in these areas are not in proximity to the relevant DFO research vessel sets. Observer results for 2013 and 2014 indicate that no coral and sponge were present in the commercial catch.</p> <p>NAFO indicated that further work was likely to be undertaken to review the nature and importance of the candidate VME features on the Tail of Bank. More specific information on the spatial overlap of the redfish fishery with the candidate VME features and their potential for impacts and recovery would be needed in order to meet SG100.</p>		
References		<p>Gordon Jr, D. C., K. D. Gilkinson, E. L. R. Kenchington, J. Prena, C. Bourbannais, K. MacIsaac, D. L. McKeown, and W. P. Vass. 2002. "Summary of the Grand Banks Otter Trawling Experiment (1993-1995): Effects on Benthic Habitat and Communities." <i>Can. Tech. Rep. Fish. Aquat. Sci./Rapp. Tech. Can. Sci. Halieut. Aquat.</i>, no. 2416: 72.</p> <p>Murillo F. J, P. Muñoz, A. Altuna, and A. Serrano 2011. Distribution of deep-water corals of the Flemish Cap, Flemish Pass, and the Grand Banks of Newfoundland (Northwest Atlantic Ocean): interaction with fishing activities. <i>ICES Journal of Marine Science</i> 68 (2): 319-332.</p>		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
	Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015. Vinnichenko V.I., A.A. Kanishchev, F.K. Yu, T.N. Gavrilik and P.A. Zavoloka 2014. Occurrence of deep-water corals and sponges within NAFO regulatory area based on the data of observations onboard Russian fishing vessels during 2008-2013. NAFO SCR Doc. 14/042		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

For UoC 2 mid-water trawl

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function			
Scoring Issue	SG 60	SG 80	SG 100	
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	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.
	Met?	Y	Y	Y
	Justification	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. Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears. Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional.		
References		Observers records		
OVERALL PERFORMANCE INDICATOR SCORE:			100	
CONDITION NUMBER (if relevant):			NA	

Evaluation Table for PI 2.4.2

For UoC 1 bottom trawl

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	<p>There is a strategy in place for managing the impact of the fishery on habitat types. In 1986, DFO implemented the <i>Policy for the Management of Fish Habitat</i> (Habitat Policy) to support the habitat protection provisions of the <i>Fisheries Act</i>. The Habitat Policy's three goals include:</p> <ol style="list-style-type: none"> 1. Conservation of existing habitats; 2. Restoration of damaged habitat; and 3. Development of new habitats. <p>In 2009, DFO published the <i>Policy for Managing the Impact of Fishing on Sensitive Benthic Areas</i> under the auspices of the Sustainable Fisheries Framework in response to the 2006 United Nations Resolution 61/105. The purpose policy is to help DFO manages 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.</p> <p>NAFO has implemented VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats.</p> <p>The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
	Justification	<p>There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved. NAFO has implemented VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats.</p> <p>The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014. The study shows that most of the fishing activity occurs on muddy sand and sandy mud bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM2 area (3LN within 100-900 meter depth) was swept on an annual basis. More realistic estimates based primarily on footgear impact suggest that only 0.1% of the total sea area is swept on an annual basis. Observer results for 2013 and 2014 indicate that no coral and sponge were present in the commercial catch.</p> <p>More specific information on the spatial overlap of the redfish fishery with the candidate VME features and their potential for impacts and recovery would needed in order to meet SG100.</p>	
c	Guidepost	There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?	Y	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
	Justification	<p>There is some evidence that the partial strategy is being implemented successfully. NAFO has implemented VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats.</p> <p>The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014. The study shows that most of the fishing activity occurs on muddy sand and sandy mud bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM2 area (3LN within 100-900 meter depth) was swept on an annual basis. More realistic estimates based primarily on footgear impact suggest that only 0.1% of the total sea area is swept on an annual basis. Observer results for 2013 and 2014 indicate that no coral and sponge were present in the commercial catch.</p> <p>More specific information on the spatial overlap of the redfish fishery with the candidate VME features and their potential for impacts and recovery would needed in order to meet SG100.</p>	
d	Guidepost		There is some evidence that the strategy is achieving its objective.
	Met?		N
	Justification	<p>NAFO has implemented VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats.</p> <p>The annual footprint of the 3LN redfish fishery was calculated for the period 2011-2014. The study shows that most of the fishing activity occurs on muddy sand and sandy mud bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM2 area (3LN within 100-900 meter depth) was swept on an annual basis. More realistic estimates based primarily on footgear impact suggest that only 0.1% of the total sea area is swept on an annual basis. Observer results for 2013 and 2014 indicate that no coral and sponge were present in the commercial catch.</p> <p>More specific information on the spatial overlap of the redfish fishery with the candidate VME features and their potential for impacts and recovery would needed in order to meet SG100.</p>	
References			

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			NA

For UoC 2 mid-water trawl

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types			
Scoring Issue	SG 60	SG 80	SG 100	
a	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
b	Justification	<p>There is a strategy in place for managing the impact of the fishery on habitat types. In 1986, DFO implemented the <i>Policy for the Management of Fish Habitat</i> (Habitat Policy) to support the habitat protection provisions of the <i>Fisheries Act</i>. The Habitat Policy's three goals include:</p> <ol style="list-style-type: none"> 1. Conservation of existing habitats; 2. Restoration of damaged habitat; and 3. Development of new habitats. <p>In 2009, DFO published the <i>Policy for Managing the Impact of Fishing on Sensitive Benthic Areas</i> under the auspices of the Sustainable Fisheries Framework in response to the 2006 United Nations Resolution 61/105. The purpose policy is to help DFO manages 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.</p> <p>Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears. Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional.</p> <p>Observer records indicate that no coral and sponge were present in the commercial catch.</p>		
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Met?	Y	Y	N
	Justification	Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears. Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional. Observer records indicate that no coral and sponge were present in the commercial catch. However, the assessment team is not aware of any testing about the impact of redfish mid-water trawl on habitats, preventing the fishery from meeting SG100.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	There is clear evidence that the strategy is being implemented successfully. Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears. Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional. Observer records indicate that no coral and sponge were present in the commercial catch.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	There is some evidence that the strategy is achieving its objective. Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears. Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional. Observer records indicate that no coral and sponge were present in the commercial catch.		
References		Observers records DFO 2009. "Sustainable Fisheries Framework" NAFO 2015. Conservation and Enforcement Measures 2015. NAFO/FC Doc. 15/01. Serial No. N6409.		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.4.3

For both UoCs

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types. The surficial sediments and features of Grand Bank have been mapped. Deep-water corals and sponges have been identified as VMEs and their occurrence and distribution have been mapped in Div. 3LN.		
b	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	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 physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types	
	Justification	<p>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.</p> <p>The annual footprint of the 3LN redfish bottom trawl fishery was calculated for the period 2011-2014. The study shows that most of the fishing activity occurs on muddy sand and sandy mud bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM2 area (3LN within 100-900 meter depth) was swept on an annual basis. More realistic estimates based primarily on footgear impact suggest that only 0.1% of the total sea area is swept on an annual basis. Observer results for 2013 and 2014 indicate that no coral and sponge were present in the commercial catch.</p> <p>Mid-water trawl gear is not designed to contact the seabed and then they do not impact with the bottom surface being less erosive than other gears.</p> <p>Therefore this gear type is designed to fish in pelagic habitats and when any interaction happens with the seafloor is exceptional.</p> <p>However, it cannot be considered that the physical impacts of the gears across the different habitat types present have been fully quantified, preventing the fishery from meeting SG100.</p>	
c	Guidepost	Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?	Y	N
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk to habitat</p> <p>Comprehensive data on the hours and areas fished by the 3LN redfish vessels continue to be collected. Bycatch of deep-water corals and sponges are required to be recorded by observers onboard groundfish fishing vessels.</p> <p>However, changes in habitats distribution over time are not collected to the knowledge of the assessment team, preventing the fishery from meeting 100c.</p>	
References	<p>Murillo F. J, P. Muñoz, A. Altuna, and A. Serrano 2011. Distribution of deep-water corals of the Flemish Cap, Flemish Pass, and the Grand Banks of Newfoundland (Northwest Atlantic Ocean): interaction with fishing activities. ICES Journal of Marine Science 68 (2): 319-332.</p> <p>Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015.</p> <p>Vinnichenko V.I., A.A. Kanishchev, F.K. Yu, T.N. Gavrilik and P.A. Zavoloka 2014. Occurrence of deep-water corals and sponges within NAFO regulatory area based on the data of observations onboard Russian fishing vessels during 2008-2013. NAFO SCR Doc. 14/042.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:			85

PI 2.4.3	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types	
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.5.1

For UoC 1 Bottom trawl

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	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 is evidence that 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.
	Met?	Y	Y	N
	Justification	<p>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.</p> <p>In the larval stage, redfish feed mainly on fish eggs and invertebrates. The larger larvae feed on copepods and euphausiids. Juvenile and adult individuals add to their diet: copepods, euphausiids and fish. On the Labrador Shelf, Greenland halibut and skate are the main predators of redfish.</p> <p>The assessment team could not find any significant concern indicating that the 3LN redfish bottom trawl fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, non-target 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, and information is available to show the negligible impact on retained, bycatch and ETP species.</p> <p>NAFO indicated that further work was likely to be undertaken to review the nature and importance of the candidate VME features on the Tail of Bank. More specific information on the spatial overlap of the redfish bottom trawl fishery with the candidate VME features and their potential for impacts and recovery would need in order to meet SG100.</p>		
References		<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p.</i></p> <p>Murillo F. J, P. Muñoz, A. Altuna, and A. Serrano 2011. Distribution of deep-water corals of the Flemish Cap, Flemish Pass, and the Grand Banks of Newfoundland (Northwest Atlantic Ocean): interaction with fishing activities. <i>ICES Journal of Marine Science</i> 68 (2): 319-332.</p> <p>Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015.</p>		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
	<p>Vinnichenko V.I., A.A. Kanishchev, F.K. Yu, T.N. Gavrilik and P.A. Zavoloka 2014. Occurrence of deep-water corals and sponges within NAFO regulatory area based on the data of observations onboard Russian fishing vessels during 2008-2013. NAFO SCR Doc. 14/042.</p> <p>Observers records on retained species, bycatch species and interactions with ETP species</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

For UoC 2 Mid-water trawl

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function			
Scoring Issue	SG 60	SG 80	SG 100	
a	Guidepost	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	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 is evidence that 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.
	Met?	Y	Y	Y
	Justification	<p>There is evidence that the mid-water trawl 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.</p> <p>In the larval stage, redfish feed mainly on fish eggs and invertebrates. The larger larvae feed on copepods and euphausiids. Juvenile and adult individuals add to their diet: copepods, euphausiids and fish. On the Labrador Shelf, Greenland halibut and skate are the main predators of redfish.</p> <p>The assessment team could not find any concern indicating that the 3LN redfish mid-water trawl fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, non-target 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 which shows that the Acadian redfish stock is healthy, data show that the catch level of retained species is low and that there were neither bycatch species caught nor interactions with ETP species. Mid-water trawl gear is not designed to contact the seabed, and there were no deep-water corals and sponges bycatches recorded in the observations for mid-water trawl. The assessment team considers that the catch composition is the old data set would generally represent the catch of the present day.</p>		
	References	Observers records on retained species, bycatch species and interactions with ETP species		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.5.2
For both UoCs

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	<p>There is a partial strategy in place, if necessary.</p> <p>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 Newfoundland 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.</p> <p>Canada has developed a 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.</p> <p>The management of 3LN redfish fishery limits harm to ecosystem structure and function. The 3LN redfish fleets operates under specific bycatch allowances, recovery strategy is implemented for wolffish, and the vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats. NAFO conservation and management measures include catch and effort limitation, bycatch allowance, recovery plans for retained species, management measures for sharks, gear requirements and VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>However, the fishery does not meet SG100 as the assessment team is not aware of any strategy that consists of a plan.</p>		

b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N

	Justification	<p>The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The management of 3LN redfish fishery limits harm to ecosystem structure and function. The 3LN redfish fleets operates under specific bycatch allowances, recovery strategy is implemented for wolffish, and the vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats. NAFO conservation and management measures include catch and effort limitation, bycatch allowance, recovery plans for retained species, management measures for sharks, gear requirements and VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The main impact of the fishery on target, non-target 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, 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.</p> <p>However, the fishery does not meet SG100 as the assessment team is not aware of any strategy that consists of a plan.</p>
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c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	<p>The partial strategy is considered likely to work, based on plausible argument. The assessment team could not find any concern indicating that the 3LN redfish bottom and mid-water trawl fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, non-target 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, 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.</p> <p>However, the fishery does not meet SG100 as the assessment team is not aware of any strategy that consists of a plan.</p>		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N

Justification	<p>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p> <p>The 3LN redfish fleets operates under specific bycatch allowances, recovery strategy is implemented for wolffish, and the vessels participating in the redfish are equipped with semi-pelagic doors to allow to lift a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats. NAFO has implemented VMEs closed areas. They are divided into two categories, the seamount closures and the sponge, coral and seapen closures. As reflected in Article 17 of the NAFO Conservation and Enforcement Measures, no vessel shall engage in bottom fishing activities in any of these areas.</p> <p>The assessment team could not find any concern indicating that the 3LN redfish bottom and mid-water trawl fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, non-target 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, 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.</p> <p>However, the fishery does not meet SG100 as the assessment team is not aware of any strategy that consists of a plan.</p>
References	<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions 3LN. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p.</i></p> <p>DFO 2009. "Sustainable Fisheries Framework"</p> <p>Murillo F. .J, P. Muñoz, A. Altuna, and A. Serrano 2011. Distribution of deep-water corals of the Flemish Cap, Flemish Pass, and the Grand Banks of Newfoundland (Northwest Atlantic Ocean): interaction with fishing activities. <i>ICES Journal of Marine Science</i> 68 (2): 319-332.</p> <p>NAFO 2015. Conservation and Enforcement Measures 2015. NAFO/FC Doc. 15/01. Serial No. N6409.</p> <p>Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015.</p> <p>Vinnichenko V.I., A.A. Kanishchev, F.K. Yu, T.N. Gavrilik and P.A. Zavoloka 2014. Occurrence of deep-water corals and sponges within NAFO regulatory area based on the data of observations onboard Russian fishing vessels during 2008-2013. NAFO SCR Doc. 14/042.</p> <p>Observers records on retained species, bycatch species and interactions with ETP species</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.5.3

For both UoCs

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>The physical environment and the chemical environment including suspended particulate matter, nutrients, oxygen, organic carbon and contaminants in Grand Bank are studied and well known.</p> <p>In the larval stage, redfish feed mainly on fish eggs and invertebrates. The larger larvae feed on copepods and euphausiids. Juvenile and adult individuals add to their diet: copepods, euphausiids and fish. On the Labrador Shelf, Greenland halibut and skate are the main predators of redfish.</p> <p>Work has been undertaken to identify EBSAs within the PB-GB LOMA. NAFO WG-EAFM identified and delineated marine benthic habitats subject to significant adverse impacts and in need of protection. In recent years, importance has been placed on encounter thresholds with sponges and corals, ecological interactions between cod, redfish and shrimps, and comprehensive lists of VME indicator species and VME elements discussed.</p>		
b	Guidepost	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	N
	Justification	<p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.</p> <p>The main impact of the fishery on target, non-target 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, 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.</p> <p>More specific information on the spatial overlap of the redfish fishery with the candidate VME features and their potential for impacts and recovery would be needed in order to meet SG100.</p>		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
c	Guidepost	The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?	Y	N
	Justification	<p>The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>The main function of target, retained, bycatch and ETP species as predators and prey in the ecosystem are known, and the role and importance of deep-water corals as nurseries for fish larvae.</p> <p>However, the monitoring of the redfish species composition in commercial catches and DFO annual research survey has been recently implemented and it is not possible to confirm that the main functions of these components are understood, preventing the fishery from meeting SG100.</p>	
d	Guidepost	Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?	Y	N
	Justification	<p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>There is a stock/population assessment for the target species, some retained, bycatch and ETP species. There is also information on habitat types and distribution.</p> <p>However, the monitoring of the redfish species composition in commercial catches and DFO annual research survey has been recently implemented and more specific information on the spatial overlap of the redfish bottom trawl fishery and the candidate VME features and their potential for impacts and recovery will be needed, preventing the fishery from meeting SG100.</p>	
e	Guidepost	Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?	Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
	Justification	<p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p> <p>There is a large quantity of information available on target, non-target and ETP species and on Grand Bank habitats. There is a stock/population assessment for the target species, some retained, bycatch and ETP species. There is also information on habitat types and distribution. 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.</p> <p>However, the assessment team makes a recommendation that the client provides up-to-date non-target species information if mid-water trawl will start to be re-used.</p>	
	References	<p>Ávila de Melo, A.M., Brites, N., Alpoim, R., and González-Troncoso, D. 2014. An ASPIC Based Assessment of Redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) in NAFO Divisions 3LN. <i>NAFP SCR Doc. 14/022. Serial No. N6317. 78 p.</i></p> <p>Baillon S., J.F. Hamel, V. E. Wareham and A. Mercier 2012. Deep cold-water corals as nurseries for fish larvae. <i>Frontier in Ecology and the Environment</i> 10 (7): 351-356.</p> <p>Murillo F. .J, P. Muñoz, A. Altuna, and A. Serrano 2011. Distribution of deep-water corals of the Flemish Cap, Flemish Pass, and the Grand Banks of Newfoundland (Northwest Atlantic Ocean): interaction with fishing activities. <i>ICES Journal of Marine Science</i> 68 (2): 319-332.</p> <p>Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015.</p> <p>Vinnichenko V.I., A.A. Kanishchev, F.K. Yu, T.N. Gavrilik and P.A. Zavoloka 2014. Occurrence of deep-water corals and sponges within NAFO regulatory area based on the data of observations onboard Russian fishing vessels during 2008-2013. <i>NAFO SCR Doc. 14/042.</i></p> <p>Observers records on retained species, bycatch species and interactions with ETP species</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85	
CONDITION NUMBER (if relevant):		NA	

Evaluation Table for PI 3.1.1

For both UoCs

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <u>organised and effective cooperation</u> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	N

<p>PI 3.1.1</p>	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Justification</p>	<p>There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.</p> <p>The Canadian fisheries management system is based on an effective national legal system that includes the powerful Acts (Fisheries Act, Oceans Act and Coastal Fisheries Protection Act) that give the Minister authority to manage both fisheries and the oceans, to implement a precautionary approach to management and to regulate foreign vessels fishing in or around Canadian waters. These Acts and the Regulations made under them enable the administration of Canadian fisheries laws at the national and regional level and Canada’s participation in numerous multi-lateral and bi-lateral fisheries management arrangements with other countries. In particular, Canada is a signatory to LOS and UNFA and a member of several RFMOs worldwide, including NAFO which establishes the TAC and provides the National Allocations of 3LN Redfish. Canada then uses its domestic fisheries management system to manage the fishing of its allocation by licensed Canadian vessels. Canada is obliged by the Article XI (Consistency of Measure/Proposals) of the NAFO Convention to ensure consistency between its management measures for fishing inside Canadian waters and those measures established by NAFO.</p> <p>NAFO is the internationally established Regional Management Fisheries Organization (RFMO) that is responsible for fisheries management measures for those fisheries that overlap with, or are completely outside, the Exclusive Economic Zone (EEZ) of the four coastal states (USA, Canada, France (in respect of St. Pierre et Miquelon), and Denmark (in respect of Faroe Islands and Greenland) in the Northwest Atlantic. NAFO’s overall objective is to contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the NAFO Convention Area.</p> <p>NAFO establishes the TAC for 3LN Redfish (which is a straddling stock) and provides the National Allocations to Contracting Parties. The TAC is set through decision/consensus of its Fisheries Commission after consideration of advice from the Scientific Council. National Allocations are decided on the basis of longstanding allocation keys that reflect past fishing history and more recent coastal states priority.</p> <p>Both NAFO and Canada’s management regime provide an effective legal system and some binding procedures for cooperation with other parties. While there is a constitutionally binding requirement to consult with aboriginal peoples and provinces on some issues, there is no general domestic requirement governing cooperation with other parties preventing the fishery from meeting SG100.</p>

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
b	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or 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.
	Met?	Y	Y	N
	Justification	<p>The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery. The Canadian fisheries management authority is not continually facing court challenges. Unresolved disputes within the Canadian fisheries management system can be, and have been, taken to the Canadian judicial system for a final decision. The most notable of these over the last two decades have been the "Sparrow", "Marshall" and "Larocque" decisions. There are provisions for appeal of licensing decision to Atlantic area appeal boards. Except for the Laroque case, challenges of the Minister's right to allocate as he see fit have not been successful.</p> <p>The Fisheries Commission is the main forum for resolving disputes at the NAFO level. After discussion of proposed management or conservation measures decisions on them are taken by vote or are adopted by consensus. In keeping with the rights of sovereign states under LOS; any contracting Party can object to a fishery management or conservation decision of the Fisheries Commission and thereby not be bound by it. There is currently no formal dispute settlement mechanism available in NAFO for directly resolving such objections. The yet to be ratified Amended NAFO Convention will have a more modern international Dispute Settlement provision that should lessen the conservation impact of Objections. The number of Objections has declined in recent years from the past.</p> <p>However, few legal disputes were brought to the Canadian legal courts. That was the case in the past with native population claims about marine resources. In this case DFO adapts the objectives and rules to court decision and generates a large negotiation with natives groups involved to integrate them to the fishery.</p>		

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
d	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2</p> <p>Canada Ongoing development of Canadian domestic quota allocation policies has provided access to various user groups in different fisheries. These arrangements are reflected in licensing policies and quota allocation arrangements that are now usually spelled out in Integrated Fishery Management Plans or in the annual fisheries management decisions posted on the Departmental website. The Canadian system does not commit formally to some rights until they have been legally proven or established and then they are implemented in a manner and timeframe consistent with the Minister’s resource conservation mandate. In other instances, fishing rights have been worked out or formalized in the context of land claims agreements which is a negotiated process headed by the Department of Indian and Northern Affairs.</p> <p>NAFO The individual Contracting Parties’ domestic policies on fishing rights would determine by whom their individual National Allocation in the NRA is fished. The individual National Allocations are based on longstanding allocation keys which past fishing history and more current coastal priority of Contracting Parties. This is not a matter that NAFO needs to concern itself with.</p> <p>While the management system respects and observes the legal rights, it does not formally commit to such rights until they have been legally proven or established by law, preventing the fishery from meeting SG100.</p>		
References		NAFO 200. “The NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries.		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
	<p>NAFO 2007. "Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries".</p> <p>Canada Fisheries Act: http://laws-lois.justice.gc.ca/eng/acts/F-14/</p> <p>Fishery (General) Regulations: http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-53/index.html</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.1.2

For both UoCs

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y

<p>PI 3.1.2</p>	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Justification</p>	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.</p> <p>The involvement of Canadian industry members and non-members in the domestic management consultations and in the preparations for, and attendance at, the annual NAFO Meetings is detailed in Section 4.5.2 above.</p> <p>The Fisheries Commission of NAFO is the major consultative and decision-making forum for the management and conservation decisions on the fisheries resources managed by that RFMO. It is composed of a maximum of 3 representatives of each contracting party as well as alternates, experts and advisors. It operates according to rules contained in the NAFO Convention. Decisions on management issues are taken at FC by formal vote in those now infrequent cases where consensus cannot be reached.</p> <p>The Canadian delegation to NAFO is led by a senior official from DFO, two Commissioners appointed from the fishing industry as well as numerous other industry and provincial officials. This practice has existed from the beginning of NAFO and is well understood by all involved on the Canadian side.</p> <p>On the Canadian domestic groundfish management scene, the main affected parties in the NL Region groundfish fishery have been variously identified since the early 1980s and participate in the DFO Newfoundland Region’s Groundfish Advisory Committees (2+3KL Groundfish, 3LNO YT Flounder and 3Ps Cod). These advisory committees comprise representatives of the >100’ sector, DFO, the provincial government, the FFAW/UNIFOR (fisherman/plant worker’s union) and academia and invited guests. A mechanism exists whereby other members (eNGO’s) are permitted to participate.</p> <p>The vast majority of fishery representatives who participate in the overall Atlantic groundfish consultative processes have done so for many years, and therefore understand their individual roles and responsibilities. Formal groundfish management on the Atlantic coast through advisory committees and annual fishing plans dates back to the late 1970s/early 1980s. The roles and responsibilities of all stakeholders in the industry have been explicitly defined over the years and key areas of responsibility and interaction are now well understood.</p>

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties.		
		The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
b	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y
	Justification	<p>The overall 3LN Redfish management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.</p> <p>NAFO's fishery management decisions are made in the Fisheries Commission in the presence of all attending Contacting Parties and admitted observers. These decisions are taken by vote or consensus after advice has been tendered by Scientific Council and debated by contracting Parties. The results of these deliberations are published in the Annual Report of the Fisheries Commission and reflect the extent to which all available information and advice was considered, accepted or rejected.</p> <p>Domestically since the groundfish moratoria in the early 1990s, the current NL Region Groundfish Advisory Committees meets on an irregular basis when there are multi-fleet management issues (e.g. quota sharing, permissible gears, seasons, areas fished) that need to be addressed. There are now very few inter-fleet management issues that need addressing because quota sharing arrangements or allocations keys and general fishing rules for all traditional groundfish stocks have been in place since before the 1992/93 moratoria. Meetings minutes are maintained by DFO and available to committee members; these minutes are approved at the subsequent committee meeting. A major avenue of consultation with 3LN Redfish EA holders is the ongoing CHP development and adjustment process which governs the fishing of all allocations held by GEAC members.</p> <p>Domestic Canadian consultations on annual NAFO issues are held several times each year by the Head of the Canadian Delegation to NAFO. The first such consultative session usually is held prior to the June Scientific Council Meeting, the second after the SC June meeting and a third is held prior to the annual NAFO meeting which takes place in September. At that annual meeting Canadian delegation meetings are held as often as deemed necessary. For strategic reasons there are no publically available records of these consultative meetings.</p>		

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties.	
		The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties	
c	Guidepost	The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?	Y	N
	Justification	<p>The consultation processes that exist for 3LN Redfish process provide opportunity for all interested and affected parties to be involved.</p> <p>Under the NAFO Rules of Procedure the Executive Secretary shall invite the following to the annual meetings of the General Council, Fisheries Commission and Scientific Council: any intergovernmental organizations that have regular contacts with NAFO on fisheries matters or whose work is of interest to NAFO as well as any non-Contracting Parties identified as harvesting fishery resources in the Regulatory Area. Non-government organizations (NGO) may attend unrestricted sessions of the annual meeting as observers upon application to the Secretariat 100 days in advance of the meeting. Such NGOs must support the general objectives of NAFO and have a demonstrated interest in the species under the purview of NAFO. If one or more contracting parties object to an applicant the matter will be put to a written vote. Accreditation is good for a five year period. Representatives of the World Wildlife Fund, the Ecology Action Centre and the Sierra Club of Canada have attended annual meetings.</p> <p>In Canada, the main affected parties in the NL Region groundfish fishery have been variously identified since the early 1980s and now participate in the DFO Newfoundland Region Groundfish Advisory Committees (2+3KL and 3Ps). These comprise representatives of the >100' sector, DFO, the provincial government, the FFAW/UNIFOR (fisherman/plant worker's union) and academic and invited guests. A mechanism exists whereby other members (eNGO's) are permitted to participate. The vast majority of fishery representatives who participate in the overall Atlantic groundfish consultative processes have done so for many years.</p> <p>DFO has a collaborative agreement with one non-governmental organization, the World Wildlife Fund (WWF) that aims to "to achieve shared objectives for the conservation, protection, and sustainable development of Canada's oceans, as mandated by the Oceans Act".</p> <p>However there is no evidence that effective engagement to all interested and affected parties is facilitated, preventing the fishery from meeting SG100.</p>	
References		<p>NAFO 200. "The NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries.</p> <p>NAFO 2007. "Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries".</p> <p>NL Region Groundfish Advisory Committees</p>	

PI 3.1.2	The management system has effective consultation processes that are open to interested and affected parties.	
	The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties	
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.1.3

For both UoCs

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long term objectives that guide decision-making, consistent with MSC Principle and Criteria and the precautionary approach, are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	N

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach	
	Justification	<p>Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within the overall management policy framework for 3LN Redfish.</p> <p>The long term fisheries objectives adopted by Canada and NAFO are detailed in Section 4.5.3 above.</p> <p>NAFO Resolution (1/08) of the General Council of NAFO which was adopted on 26 September 2008 (NAFO 2008) on the Interpretation and Implementation of the Convention on the Future Multilateral Cooperation in the Northwest Atlantic Fisheries outlines the organization’s revised long term overall objectives that Contracting Parties intend to follow. Item (b) indicates: “apply the precautionary approach in accordance with Article 6 of the 1995 Agreement (UNFA)”. Development of a Risk-Based Management Strategy for 3LN Redfish (FC-SC RBMS WP 14/4 Rev 3)” which has been adopted by NAFO’s FC at the 2014 Annual Meeting outlined the current precautionary approach to management of the 3LN redfish stock. (NAFO 2014a). This involves using a series of pre-set annual TAC increases to rebuild the stock which will be subjected to risk analysis by Scientific Council very second year. These annual TAC increases are described as Harvest Control Rules as the stock increases; HCRs for managing stock declines have yet to be developed.</p> <p>Canada DFO has extensive statements of mission, objectives and priorities posted on its national website. The Department has developed its “Sustainable Fisheries Framework” to achieve its objective of sustainable fisheries and aquaculture. Overall, it advances the Sustainable Fisheries Framework as the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada. The website outlines the Department’s intention to incorporate this approach into all Integrated Fishery Management Plans. While the department’s long-term objectives are consistent with MSC Principles and Criteria and the precautionary approach, Canada is subject to the type of precautionary approach for setting the 3LN Redfish TAC that is implemented by majority vote or consensus of the Fisheries Commission. Domestically it is still unclear as to the extent the PA will restrict the Minister’s absolute powers under the Fisheries Act. All domestic IFMPs contains a statement to the effect that the IFMP can be modified at any time and does not fetter the Minister’s discretionary powers set out in the Fisheries Act. These can be used to make any modification to an IFMP for conservation or any other valid reason.</p>
References	<p>DFO 2009. “Sustainable Fisheries Framework”</p> <p>DFO 2013. “Vision, Mission, Mandate”</p> <p>NAFO 200. “The NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries.</p> <p>NAFO 2007. “Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries”.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 3.1.4

For both UoCs

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Partial
	Justification	<p>The overall 3LN Redfish management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.</p> <p>NAFO Resolution (1/08) part (f) (NAFO 2008), commits CPs to “prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources”; and part (h) requires them “to adopt measures to prevent, deter and eliminate IUU fishing activities.”</p> <p>The decline in the numbers of vessels fishing annually in the NRA as documented in the annual Compliance Review report of STATIC indicates that CPs are managing the levels of fishing effort by their fleets. It is unknown what financial or other incentives or subsidies exist for fleets of the various NAFO CPs other than Canada.</p> <p>Objective 5.1 of the NL Region’s 2+3KL Groundfish IFMP (DFO 2013c) (Stock Conservation and Ecosystem – Sustainability) specifically includes promoting the sustainable utilization of groundfish resources and cost-effective harvesting strategies that ensures compliance with management and conservation measures. The Groundfish Enterprise Allocation (EA) program encourages good fishing practices and reduces the tendency to overharvesting through use of unnecessary fishing effort.</p> <p>Only three fishing vessels (with one doing most of the harvesting), owned by the major allocation holder, are used to fish the Canadian allocation. All catches are processed and frozen at sea and transhipped to market from one Canadian port (Bay Roberts, NL). The pace of fishing throughout the year is determined by confirmed marketing contracts.</p> <p>There are no negative incentives or subsidies in the Canadian 3LN Redfish fishery. Canadian fishery legislation contains a detailed legislative penalty structure with significant financial penalties to deter negative behaviour.</p> <p>There is no mechanism that considers incentives in a regular review of management policy, preventing the fishery from fully meeting the SG100.</p>		

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
References	<p>DFO 2013c. "Integrated Fisheries Management Plan (IFMP) 2+3KL"</p> <p>DFO/GEAC 2015 "Conservation Harvesting Plan (CHP,) Atlantic-Wide Licence Holders For Vessels, Greater Than 30.48m Loa".</p> <p>NAFO 200. "The NAFO Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries.</p> <p>NAFO 2007. "Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries".</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.1

For both UoCs

PI 3.2.1	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2			
Scoring Issue	SG 60	SG 80	SG 100	
a	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
Met?		Y	Partial	N

PI 3.2.1	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2	
	Justification	<p>Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the overall 3LN Redfish fishery's management system.</p> <p>NAFO's 3LN redfish management plan contains short and long term objectives for stock rebuilding as well as a harvest control rule for TAC increases. These are outlined in "Development of a Risk-Based Management Strategy for 3LN Redfish (FC-SC RBMS WP 14/4 Rev 3)" which has been adopted by NAFO's FC at the 2014 Annual Meeting (NAFO 2014a). They include stepwise TAC increases out to 2020 which will be monitored and fully assessed every 2/3 years with a full evaluation taking place after seven years.</p> <p>The long-term objective of 3LN redfish Conservation Plan is to maintain the biomass in the 'safe zone', as defined by the NAFO Precautionary Approach framework, and at or near B_{msy}. The Conservation Plan does not include specific objectives for Principle 2.</p> <p>There is currently no IFMP for the 3LN redfish. However, the NL Region's Groundfish IFMP for 2+3KL indicates it strives to manage groundfish stocks (and the fisheries on them) based on the following principles or long term objectives:</p> <ul style="list-style-type: none"> • Conservation and Ecosystem Considerations; • Stewardship; • Social, Cultural and Economic Benefits to Stakeholders; and • Fisheries Compliance. <p>The IFMP then sets out a series of short-term objectives in the form of various strategies and management measures that are in place, or are in the process of being developed, "to maximize the benefit of this resource for all Canadians." The NL Region advised the Assessment Team that these strategies and management measures would also apply to the 3LN Redfish fishery.</p> <p>Based on the evidence provided above, a partial score is assigned.</p> <p>The assessment team has been informed that DFO Newfoundland and Labrador Region is in the process of updating the IFMP for groundfish fisheries. The plan is to incorporate the 3LN redfish fishery in a revised IFMP that will be applicable to all groundfish fisheries in 2 + 3KLMNO. The target is to circulate the draft revised IFMP by the end of March 2017.</p> <p>Therefore the fishery fully meets SG60 and partially meets SG80.</p>
References	<p>DFO 2013c. "Integrated Fisheries Management Plan (IFMP) 2+3KL"</p> <p>NAFO. 2014. Part D: Scientific council Ad hoc working group on management strategies for redfish in Div. 3LN, 13 May 2014. NAFO SC 13 May 2014. 27 p.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		70
CONDITION NUMBER (if relevant):		2

Evaluation Table for PI 3.2.2

For both UoCs

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	<p>There are established decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>There is an annual recurring and comprehensive fishery management decision-making cycle in the 3LN Redfish fishery at the domestic and NAFO that is well known in the industry in the Atlantic area.</p> <p>At the annual NAFO meeting the Fisheries Commission decides by vote (or agrees by consensus) on the TAC and associated conservation measures for the next year's fishery. These FC decisions also include the level of National Allocations which are determined by the use of long established national allocation keys.</p> <p>By the conclusion of the NAFO annual meeting, Canadian industry is then aware of their level of participation in the 3LN Redfish fishery for the upcoming year. Canadian fleet sector shares of this quota (and all Canadian Atlantic groundfish species) are also based on long standing allocation keys. Details of fishing plan measures and the preparation and approval of CHPs takes place at the DFO Regional levels. The CHP for 3LN redfish is part of GEAC's "evergreen" groundfish CHP which is adjusted only as necessary in bi-lateral consultation with DFO</p>		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.			
	Justification	<p>Decision-making processes for 3LN Redfish respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>The annual recurring fishery management decision-making cycle for 3LN Redfish fishery involves a domestic Canadian and NAFO Contracting Party fisheries data/information collection followed by a scientific analysis phase. The annual Canadian domestic government/industry NAFO consultations take place on science and fishery management issues and problems. The final stage in this annual recurring and comprehensive fishery management decision-making cycle is the annual meeting of NAFO and its constituent bodies where scientific advice is given and debated and consensus or decision sought on management measures for the following fishing season. This does not go so far as to say that all issues identified are responded to or that the process takes account of the wider implications of decisions, preventing the fishery from meeting SG100. However the adoption of the Precautionary approach generally and a RBMS and Reference Points for 3LN Redfish indicates that a wider range of considerations are now involved than in the past.</p>		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	<p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p>The NAFO decision-making processes uses the precautionary approach and are based on best available information.</p> <p>Development of a Risk-Based Management Strategy for 3LN Redfish (FC-SC RBMS WP 14/4 Rev 3)" which has been adopted by NAFO's FC at the 2014 Annual Meeting outlines the current precautionary approach to management of the 3LN redfish stock. This involves using a series of pre-set annual stepwise TAC increases to rebuild the stock which will be subjected to risk analysis by Scientific Council, a full stock assessment every 2/3 years and a full review after seven years. These annual TAC increases are described as Harvest Control Rules as the stock increases. HCRs for managing stock declines have been adopted during the September 2016 Annual meeting.</p>		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	N
	Justification	<p>Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p> <p>Annual Reports such as those of the Fisheries Commission and Scientific Council, the Annual Compliance Report and the Implementation Status of Recommendations from the NAFO Performance Assessment constitute comprehensive reporting to all interested stakeholders on research, monitoring, evaluation and review activity. These and other annual reports are readily available on the NAFO website. They appear to address the most pressing annual stock/fishery management issues as well as other longer term issues such as Performance Review, Amendment of the NAFO Convention and Ecosystem Science and Assessment.</p> <p>However, a N was assigned to 100d as there are no explicit fishery-specific objectives adopted in the fishery management system to formally evaluate the fishery performance against.</p>		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	Y

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.	
Justification	<p>The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges</p> <p>Legal challenges do not appear to exist in respect of NAFO which operates and is generally governed by the current status of LOS and the various subsequent international agreements (UNFA), UNGA resolutions and International Plans of Actions.</p> <p>The Canadian fishery management system may not have always acted proactively but it usually implements binding judicial decisions arising from legal challenges within the timeframes spelled out by the courts. Again, the Sparrow, Marshall and Larocque decisions are significant recent examples.</p> <p>Proactive measures aimed at avoiding fisheries disputes are taken principally through the advisory committee or bi-lateral CHP process and at other meetings between the parties and interested stakeholder groups during the year. This allows the parties to proactively identify issues and resolve differences before they escalate into legal challenges.</p> <p>There are no apparent legal issues in the Canadian 3LN Redfish fishery.</p>	
References	<p>DFO/GEAC 2015 "Conservation Harvesting Plan (CHP,) Atlantic-Wide Licence Holders For Vessels, Greater Than 30.48m Loa".</p> <p>NAFO, 2016. NAFO 2016a. Report of the NAFO Joint Fisheries Commission-Scientific Council Working Group on Risk-Based Management Strategies. 4-6 April 2016. Torshavn, Faroe Islands. NAFOI Dartmouth, Nova Scotia, Canada. 2016. Serial No. N6532.</p> <p>NAFO. 2016b. Recommendations from the FC-SC Joint Working Group on Risk-based Management Strategies (WG-RBMS) to forward to FC and SC. 38th Annual Meeting – September 2016. FC-SC Working Paper 16/02. [FC agenda item 8].</p> <p>NL Region Groundfish Advisory Committees</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.3

For both UoCs

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	<p>A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. The overall MCS activities by Canada and NAFO are detailed in 4.5.7 above.</p> <p>The NAFO Conservation and Enforcement Measures (CEM), which are revised annually by the Fisheries Commission, contain a plethora of required actions by contracting and their vessels fishing in the NAFO Regulatory Area (NAFO 2014b). The Conservation and Enforcement Measures for 2015 constitutes a 190 page document covering such requirements as fish sizes, gear specifications, reporting requirements, Observer coverage, VMS requirements, catch reporting obligations, the Joint Inspection and Surveillance Scheme, responsibilities of Port and Flag state contracting Parties etc. The various CEMs are implemented by each contracting party.</p> <p>The primary avenue for enforcement in the NRA is through the Joint Inspection and Surveillance Scheme. This permits NAFO Inspectors from contracting parties to board and inspect vessels under the protocols contained in the Conservation and Enforcement Measures. (All Contracting Parties do not deploy patrol vessels or Inspectors in the NRA.) During these inspections, citations can be issued for apparent infringements (AI); these are reported to NAFO and the respective contracting party. In the case of serious infringements the contracting party is required to recall its vessel from the NRA for further investigation at home. In such cases the contracting party is required to report to NAFO on the follow-up actions that were taken following the in-port investigation.</p> <p>Canada Enforcement measures in the 3LN Redfish fishery include:</p> <ul style="list-style-type: none"> • Air surveillance. • Operational inspections by fishery patrol vessels of gear and vessel licence authorizations, catch on board. • Random checks on landings by land-based DFO fisheries officers. • Comprehensive Fishery Officer audit of data from all sources. • Dockside monitoring of all landings. • At-sea observers. • Electronic Vessel Monitoring System (VMS) • Daily reporting of position, catch and other information. • Hail-in/out is a requirement for the start and ending of a fishing trip. <p>These various licensing, conservation, protection and compliance measures are contained in license conditions attached to the groundfish licence issued to eligible operators. This licence must be on board the vessel at all times.</p>		
b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	Justification	<p>At the Canadian domestic and the NAFO level sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.</p> <p>The 2014 Compliance Report gives a fairly positive picture of the low level of non-compliance with NAFO CEMs generally. It did note "Recent resolution (of Apparent Infringements) has been satisfactory, but there are still pending cases with no additional detail provided on their status."</p> <p>The NAFO website indicates The rate of "clean" inspection reports (i.e. the inspections that did not result in a citation) has been fairly constant since 2003, about 95% of annual the at-sea inspections performed. In 2013 only two different AI were detected." None of these involved fishing for 3LN Redfish.</p> <p>There is some doubt whether sanctions, are always consistently applied and demonstrably provide effective deterrence, preventing the fishery from meeting SG100.</p> <p>The Canadian 3LN Redfish fishery is now mostly conducted by one vessel which is considered a specialized redfish harvesting harvesting/processing platform. Harvesting takes place only when market commitments have been arranged. The processed-at sea catches are landed for transshipment to market at a single port under the monitoring of a Dockside Monitoring company. No infractions have been detected in this fishery since reopening.</p>	
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.
	Met?	Y	N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	Justification	<p>Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p> <p>The 2014 Compliance Report noted the following shortfalls in reporting: -Untimely and incomplete Observers Reports submitted by Contracting Parties. - Additional analysis is necessary to ensure that Contracting Parties are complying with minimum observer coverage levels and submitting the required reports.” This leaves some doubt as to whether there can be a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery, preventing the fishery from meeting SG100.</p> <p>The Canadian fishery is prosecuted mostly by one Canadian vessel. There have been no infractions detected or warnings issued or charges laid in the past three years.</p>	
d	Guidepost		There is no evidence of systematic non-compliance.
	Met?		Y
	Justification	<p>There is no evidence of systematic non-compliance. Both domestically and internationally there appears to be a high level of compliance with the various regulatory requirements for 3LN redfish.</p> <p>The Canadian fishery is prosecuted by mostly by one Canadian vessel. There have been no infractions detected or warnings issued or charges laid in the past three years.</p> <p>Only three other contracting parties hold national allocations for this species in the NRA. The NAFO website indicates “the number of citations from at-sea inspections can be used to estimate the compliance of fishing vessels with the NAFO conservation and management measures. The rate of “clean” inspection reports (i.e. the inspections that did not result in a citation) has been fairly constant since 2003, about 95% of annual the at-sea inspections performed. In 2013 only two different AI were detected.” None of these involved fishing for 3LN Redfish. There is no evidence of systematic non-compliance in this fishery</p>	
References		<p>NAFO 2015. Conservation and Enforcement Measures 2015.</p> <p>NL Region Groundfish Enforcement and Compliance, 2012-2015, provided by DFO during site visit.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 3.2.4

For both UoCs

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>A document on 3LN Redfish Research Activities was provided to the Assessment Team during the Site Visit that constitutes the DFO's NL Region's Research Plan for science activities regarding 3LN Redfish. Scientific Advice for 3LN Redfish stock management is provided by NAFO's Scientific Council as requested by the Fisheries Commission.</p> <p>The Annual Report of NAFO's Scientific Council lists the various scientific activities that the SC, its sub-committees and its several working groups will pursue in the coming year in respect of all fish stocks and ecosystems managed by NAFO.</p> <p>The fishery does not meet SG100 it cannot be said that the research plan is comprehensive as it does not provide a detailed description of each research activities/project and a timeline.</p>		
b	Guidepost	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management	
	Justification	<p>Research results are disseminated to all interested parties in a timely fashion.</p> <p>Scientific Advice for 3LN Redfish stock management is provided by NAFO's Scientific Council as requested by the Fisheries Commission.</p> <p>The final Research Reports are publically available on the NAFO website when completed and peer reviewed. These are found in the Annual Reports of the Scientific Council and its Constituent bodies.</p> <p>Details of all matters addressed by the Scientific Council are published in annual NAFO Scientific Council Reports. Minutes or details of internal SC and sub-committee discussions are not published.</p> <p>NAFO also publishes the Journal of Northwest Atlantic Fishery Science that focuses on environmental, biological, ecological and fishery aspects of living marine resources and ecosystems of the Northwest Atlantic. All these documents are available on the NAFO website.</p> <p>The fishery does not meet SG100 as it cannot be said that the research plan and all results are widely and publically available.</p>	
References		<p>DFO's NL Region's Research Plan for science activities regarding 3LN Redfish</p> <p>DFO publications: http://www.dfo-mpo.gc.ca/science/Publications/index-eng.htm; http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm</p> <p>NAFO publication: https://www.nafo.int/Publications</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 3.2.5

For both UoCs

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
	Justification	<p>The fishery has in place mechanisms to evaluate key parts of the management system.</p> <p>The DFO Internal Checklist is divided into three sections including target stock information, habitats/ecosystems and management systems. This checklist has been adopted and used internally by DFO as a tool to measure effectiveness of all fishery management systems. However, results of these reviews generally are not available to assessment teams.</p> <p>The Canadian Auditor General has the mandate to, and does, review the management of fisheries on an ad-hoc basis and publishes the results. The Parliament of Canada has two Committees pertaining to Fisheries and Oceans: the Standing Committee on Fisheries and Oceans of the House of Commons and the Standing Senate Committee on Fisheries and Oceans of the Senate. These standing committees regularly examine various aspects of fishery management in Canada and prepare public reports on findings and conclusions.</p> <p>All stock assessments are reviewed as part of the annual Scientific Council meetings as well as those of its Standing committees (STACFIS and STACRES). Scientists from most contracting parties contribute to and review the science data and analysis that is presented as part of each stock assessment. This stock assessment is peer-reviewed at STACFIS and then at Scientific council who presents the results and advice to the Fisheries Commission. This final decision-making body debates, accepts or rejects the advice and sets management measures accordingly.</p> <p>The presence of observers at Scientific Council and Fisheries Commission meetings does provide a level of transparency and some critical review of decisions. All Scientific Council and Fisheries Commission proceedings are published in a timely fashion on the NAFO websites.</p> <p>In 2009 NAFO established a General Council Performance Assessment Working Group (PAWG) which assessed the performance of NAFO since 1979 against the objectives set out in the NAFO Convention and other relevant international instruments on the conservation and management of marine living resources. The Report was presented and adopted at the 2011 Annual meeting. This will be a 5-year recurring process.</p> <p>The assessment team concludes that evaluation of the fishery management system against all fishery specific objectives is not clearly seen to be undertaken, preventing the fishery from meeting SG100.</p>		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N

PI 3.2.5	There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system	
	Justification	<p>The 3LN redfish fishery-specific management system is subject to regular internal and occasional external review.</p> <p>The DFO internal Fishery Checklist has been adopted and used internally by DFO as a tool to measure effectiveness of all fishery management systems. However, results of these reviews generally are not available.</p> <p>The 2+3KL Groundfish IFMP states: “Monitoring control and surveillance of the Fisheries will be accomplished using several tools including quota reports, IQ and EA status reports, and end-of-year quota reports that provide resource managers with hindsight into efficiency of management tools for a given year.</p> <p>Post season analysis sessions will be conducted with C&P and Resource Management staff to review issues encountered during the previous season and to make recommendations on improving management measures. These sessions will be conducted at the Area level and the regional level and include all sectors of DFO.”</p> <p>The general view of groundfish fishery management personnel is that the annual fishery advisory and CHP sessions constitute an external review of fishery management measures as both industry and non-industry members participate and that this meets the need for real-time, in-season, annual and overall management system reviews.</p> <p>The presence of observers at NAFO’s Scientific Council and Fisheries Commission meetings does provide a level of transparency and some critical review of decisions. All Scientific Council and Fisheries Commission proceedings are published in a timely fashion on the NAFO websites.</p> <p>The Annual Compliance Review by STATIC constitutes a review and critique of the degree to which CEMS are functioning annually and over time.</p> <p>The NAFO Performance Review will be conducted every five years with a team that includes three internationally qualified members who have no connection with NAFO.</p> <p>It cannot be said that the fishery-specific management system is subject to regular external review, preventing the fishery from meeting SG100.</p>
References	DFO internal Fishery Checklist NAFO meetings: https://www.nafo.int/Meetings NL Region Groundfish Enforcement and Compliance, 2012-2015, provided by DFO during site visit.	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Appendix 1.2 Risk Based Framework (RBF) Outputs

Appendix 1.2.1 Scale Intensity Consequence Analysis (SICA)

Not relevant. RBF has not been used to score the fishery.

Appendix 1.3 Conditions and Client Action Plan

Following are the stated conditions as provided in the Draft Client Report dated November 1, 2016.

In addition to the general requirements, the Client Group (client) must also agree in a written contract with an accredited MSC certification body to meet the specific conditions as described below within the timelines that will be agreed in the 'Action Plan for Meeting the Condition for Continued Certification' that is to be approved by SAI Global.

Table A1.3: Condition 1

Performance Indicator	PI 2.1.3 Retained Species Information
Score	75
Rationale	<p>Sufficient data continue to be collected to detect any increase in risk level to all main retained species except for deep-water redfish. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species except for deep-water redfish species.</p> <p>The redfish species-specific monitoring is now in place in the DFO fall survey and in sampling of commercial catches. However, given its recent implementation (autumn 2015) it cannot said that sufficient data continue to be collected to detect any increase in risk level.</p>
Condition	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk level to deep-water redfish.
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that redfish species-specific monitoring was carried out and results shall be presented. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that redfish species-specific monitoring was carried out and results shall be presented. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that redfish species-specific monitoring was carried out and results shall be presented. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By Year 4:</u> The client shall provide evidence that sufficient data continue to be collected to detect any increase in risk to the deep-water redfish. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Client action plan	<p><u>Action Plan</u> GEAC and DFO have agreed on methods to sample and test Anal Fin Ray (AFR) counts as a proxy for species identification of redfish caught in DFO's Fall Survey and the commercial fishery, and analysis of results for 2015 was provided to the Assessment Team.</p> <p>By Year 1: Evidence will be presented that an update report on results has been produced.</p>

	<p>By Year 2: Evidence will be presented that an update report on results has been produced.</p> <p>By Year 3: Evidence will be presented that an update report on results has been produced.</p> <p>By Year 4: Evidence will be presented that a consolidated report has been prepared by the Client, evaluated by a scientific expert, and forwarded for the consideration of DFO Science.</p> <p><u>Responsible parties</u> GEAC DFO</p>
Consultation on condition	DFO

Table B1.3: Condition 2

Performance Indicator	PI 3.2.1 Fishery-Specific Objectives
Score	70
Rationale	<p>Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the overall 3LN Redfish fishery’s management system.</p> <p>NAFO’s 3LN redfish management plan contains short and long term objectives for stock rebuilding as well as a harvest control rule for TAC increases. These are outlined in “Development of a Risk-Based Management Strategy for 3LN Redfish (FC-SC RBMS WP 14/4 Rev 3)” which has been adopted by NAFO’s FC at the 2014 Annual Meeting (NAFO 2014a). They include stepwise TAC increases out to 2020 which will be monitored and fully assessed every 2/3 years with a full evaluation taking place after seven years.</p> <p>The long-term objective of 3LN redfish Conservation Plan is to maintain the biomass in the ‘safe zone’, as defined by the NAFO Precautionary Approach framework, and at or near B_{msy}. The Conservation Plan does not include specific objectives for Principle 2.</p> <p>There is currently no IFMP for the 3LN redfish. However, the NL Region’s Groundfish IFMP for 2+3KL indicates it strives to manage groundfish stocks (and the fisheries on them) based on the following principles or long term objectives:</p> <ul style="list-style-type: none"> • Conservation and Ecosystem Considerations; • Stewardship; • Social, Cultural and Economic Benefits to Stakeholders; and • Fisheries Compliance. <p>The IFMP then sets out a series of short-term objectives in the form of various strategies and management measures that are in place, or are in the process of being developed, “to maximize the benefit of this resource for all Canadians.” The NL Region advised the Assessment Team that these strategies and management measures would also apply to the 3LN Redfish fishery.</p> <p>Based on the evidence provided above, a partial score is assigned.</p> <p>The assessment team has been informed that DFO Newfoundland and Labrador Region is in the process of updating the IFMP for groundfish fisheries. The plan</p>

	is to incorporate the 3LN redfish fishery in a revised IFMP that will be applicable to all groundfish fisheries in 2 + 3KLMNO. The target is to circulate the draft revised IFMP by the end of March 2017.
Condition	The client must provide documented evidence that short and long-term objectives for the 3LN Redfish fishery have been adopted which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system.
Milestones	<u>By year 1:</u> The client is required to provide evidence of progress toward a commitment by the management agencies to incorporate short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, within the fishery's management system. Meeting this milestone would likely not result in a change in score at this surveillance audit. <u>By year 2:</u> The client will provide evidence that short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.
Client action plan	<u>Action Plan</u> By Year 1: The Client will provide evidence that DFO has circulate a draft IFMP applicable to the 3LN Redfish fishery, with short and long-term objectives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. By Year 2: The Client will provide evidence that DFO has adopted an IFMP applicable to the 3LN Redfish fishery, with short and long-term objectives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. <u>Responsible parties</u> GEAC DFO
Consultation on condition	DFO

DFO support on Client Action Plan

From: "Coffin, David" <David.Coffin@dfo-mpo.gc.ca>

Subject: RE: Feedback Requested: MSC 3LN redfish: Revised Draft Client Report

Date: December 8, 2016 at 1:49:27 PM EST

To: Bruce Chapman <bchapman@sympatico.ca>

Cc: Kris Vascotto <vascotto@vrsi.ca>, "Power, Don" <Don.Power@dfo-mpo.gc.ca>, "Walsh, Ray" <Ray.Walsh@dfo-mpo.gc.ca>, "Pilgrim, Brooks B" <Brooks.Pilgrim@dfo-mpo.gc.ca>, "Tobin, Derek (Duke)" <Derek.Tobin@dfo-mpo.gc.ca>

Bruce,

DFO accepts the action plan and will work toward delivering the IFMP within the timelines identified by the client.

Dave

From: Bruce Chapman [<mailto:bchapman@sympatico.ca>]

Sent: December-08-16 11:08 AM

To: Coffin, David
Cc: Kris Vascotto; Power, Don; Walsh, Ray; Pilgrim, Brooks B; Tobin, Derek (Duke)
Subject: Re: Feedback Requested: MSC 3LN redfish: Revised Draft Client Report

Dave,

For clarity, does DFO accept the following Action Plan:

By Year 1: The Client will provide evidence that DFO has circulate a draft IFMP applicable to the 3LN Redfish fishery, with short and long-term objectives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.

By Year 2: The Client will provide evidence that DFO has adopted an IFMP applicable to the 3LN Redfish fishery, with short and long-term objectives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.

Bruce

From: Pilgrim, Brooks B
Sent: 2016–December-06 10:56 AM
To: Healey, Brian
Cc: Power, Don
Subject: Feedback Requested: MSC 3LN redfish: Revised Draft Client Report

Hi Bruce,

This is to confirm that DFO is in agreement with Condition 1 (PI 2.1.3 Retained Species Information) contained in the MSC Canada 3LN Redfish Client Draft Report. As discussed, the Client Action Plan states that GEAC will commit to all work related to collection of Redfish Anal Fin Ray counts and conducting all scientific analysis of samples collected. There is no commitment from DFO to conduct any scientific work at this time and any work completed will be the responsibility of GEAC. A final report of results will be provided to DFO Science for consideration as stated in the Client Action Plan

Appendix 2. Peer Review Reports

Peer Reviewer 1's comments

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> I believe the team has arrived at an appropriate conclusion re certification of this fishery. I agree with much of their scoring, and where I have suggested a change, or questioned a score, the proposed changes are small and none would result in modification of any pass/fail criteria. In a few places I have suggested additional or enhanced text to justify the scores given.		Changes have been done and additional information/data have been provided in several sections of the report to better support the team's conclusion and scores given.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> Conditions as written seem OK, and should result in the PI's achieving the SG80 level in the time specified.		A response is not necessary.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> Condition 1. Given that collection of the necessary data to differentiate the 2 redfish IPI species began in 2015, the action plan should be sufficient, as long as the necessary sampling is continued for the years indicated and the results evaluated. Results of this sampling would benefit from peer-review (e.g. at NAFO SC). Condition 2 should be closed upon delivery of the stated IFMP, and the Plan and Milestones seem to be well positioned to accomplish this by Year 2.		A response is not necessary.

General Comments on the Assessment Report (optional)

The assessment team has done a good job in compiling the available information, writing the report, and scoring the fishery. There is perhaps some difficulty in scoring certain PI's for the mid-water trawl UoC, given that the gear is presently not used and data are sparse. But the assessment team has done a good job in interpreting available information for that gear and scoring the various PI's appropriately.

A key component of the assessment is the treatment of *Sebastes mentella* as an IPI species, and that *Sebastes fasciatus* is the predominant species in the fishery. Some evidence is provided to justify this (e.g. pages 24-25), but the information is not complete to indicate the actual percentage of *S. mentella* in the catches. It is noted that the necessary data from surveys and the fishery have only been

collected since 2015, but can some of these data and results of analyses be shown here? The quoted reference for the analysis is an internal GEAC document – has this paper been peer-reviewed, and is it widely available? Given that the authors of the NAFO SC 3LN redfish assessment continue to state that *S. mentella* is the predominant species in 3LN redfish catches, it would seem to be important to clearly demonstrate otherwise for the purposes of this MSC report. It is also recognized that the first of the two conditions placed on the fishery require sufficient data continue to be collected to detect increased risk to *S. mentella* in this fishery.

[Assessment team's response:](#) text and figures (Figures 12 and 13) have been added in 4.3.1.1. Species composition section to clearly demonstrate that *S. fasciatus* is the predominant species in catches. The GEAC document is a summary of the results of species composition analysis provided by DFO, the paper/document has not been published yet but is not confidential.

Principle 1 does not reference the 2016 SC assessment of the stock, and uses the results from the previous (2014) assessment. Other sections of the report do reference some of the 2016 NAFO SC and FC work. This is not a crucial point, as the 2016 and 2014 SC assessments appear to give similar results, but it is just a matter of consistency.

[Assessment team's response:](#) Principle 1 background section and scoring tables have been amended to reflect the 2016 stock assessment model and results.

The text description for habitat and ecosystem in Section 4.4.4 refers to the NAFO work on habitats and ecosystem (e.g. Fig. 22) but not in detail. However in Principle 3, there are comparisons of the Canadian/DFO and NAFO management systems. In my opinion, the text in 4.4.4 would benefit from inclusion of some further description of the NAFO ecosystem/habitat research and management measures, as there has been substantial work done there in recent years.

[Assessment team's response:](#) additional information on the NAFO ecosystem/habitat research and management measures have been added in section 4.4.4.

In evaluating the scores for some PIs, particularly in Principle 3, I have drawn some comparisons with the most recent MSC report for 3LNO yellowtail flounder, which is also a Grand Bank straddling stock managed by NAFO. This is one of the stocks in the “harmonization” list in Table 13.

Performance Indicator Review

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	SI a Given that the stock is above Bmsy and several times larger than the Blim RP, the 100 score here is acceptable.. SI b Stock is clearly estimated to be above Bmsy for several years (recently by 35-40%), and several times above the B30% limit RP. This is confirmed by the 2016 NAFO SC assessment. Although Bmsy is not an explicit target in the NAFO PA framework, it is established in the management strategy evaluation conducted for this stock in 2014.	A response is not necessary.

1.1.2	Yes	No	NA	<p>SI a Agreed</p> <p>SI b Perhaps 80 is the better score here. There are no properties of the B30% limit RP explicitly associated with recruitment impairment, and there is no S/R relationship for 3LN redfish. Evidence available suggests the limit RP is set above the level at which there is an appreciable risk of impairing reproductive capacity but there does not appear to be full consideration of all precautionary issues..</p> <p>SI c Perhaps 80 is a better score here also. Bmsy-based targets are in the management strategy adopted for this stock, but is there sufficient evidence that the ecological role of the stock has been considered with a high degree of certainty? If so, it needs to be stated clearly to justify a score of 100.</p>	<p>SIb: The team agrees that B30% limit RP may be reasonable as generic LRP, but there is no analytical basis to support it for Div. 3LN redfish. Work on other stocks of redifsh indicate that 40% Bmsy may be more appropriate. Furthermore, the assessments can not examine this issue since it fixes MSY. The team revised its conclusion and SG100 is now not met for this SI.As a result, the score of the PI was downgraded from 100 to 90.</p> <p>Sic: The team disagrees with the peer reviewer. As the reviewer notes, the first part of scoring issue is satisfied, but questions whether the second clause is satisfied, namely: "... and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty."The team suggests that while the assessment and management does not specifically entertain and environmental issues in the assessment and management, neither is the team aware of any specific environmental issues that have been noted as especially "relevant" to this population.</p>
1.1.3	NA				
1.2.1	Yes	Yes	NA	<p>SI a, b, c, d Agreed. Recent MSE is very positive in this regard (and the follow-up to the MSE work proposed by NAFO could be mentioned in ther justification for S1 c).</p>	<p>SI c. The team added the comment that the 2014 MSE harvest strategy was re-evaluted in the 2016 assessment as well as noting that NAFO is crmitted to conducting a full evaluation of the</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					management strategy on or before 2020.
1.2.2	Yes (but)	Yes	NA	<p>SI a Score is OK. The current NAFO PA Framework (adopted in 2004) does not contain a target biomass (Btr). The description in the scoring table refers to Btr, and the schematic in Fig 13 is the initially proposed NAFO PA, not the one eventually adopted (see FC Doc 04/18). But the rest of the rationale provided is sound, given that a target biomass is specified in the MSE, and is consistent with the PA.</p> <p>SI b Agreed, particularly given the results of the MSE.</p> <p>SI c Agreed. Rationale describes mostly pre-MSE. May want to include in the rationale the recent TAC decisions by NAFO FC (i.e. MSE based).</p>	<p>SI a: The summary in the justification was updated to reflect the correct NAFO PA.</p> <p>SI c: Comments added to reflect MSE influence on harvest strategy and indication that the strategy appears successful.</p>

1.2.3	Yes	No	NA	<p>SI a Score of 100 here really depends on accepting that the current information on redfish stock structure and productivity is comprehensive. I lean more towards a score of 80 based on the stock/species composition uncertainty, lack of stock-recruit understanding, and no age or length-based assessment. But the data as collected does appear to support the harvest strategy, and there is comprehensive environmental data. If the authors strongly feel that a score of 100 is justified, the rationale should be strengthened. Could also add in the rationale here that only 3 vessels prosecute this fishery, making fleet data easy to check.</p> <p>SI b The only question here may be with the overall stock catch data. There have been issues with NAFO catch reporting for some stocks/fleets in the past. Has there been improvement in this regard recently? Is there a high degree of certainty, particularly considering the IPI species mix question? Perhaps a score of 80 would be better.</p> <p>SI c Agreed</p>	<p>SI a: The team agrees with the change recommended by the peer reviewer. Stock productivity remains effectively unknown. The assessment effectively sets productivity by fixing MSY at 21000 t. However, the assessment does not explore the sensitivity of the assessment and its output to alternative values for MSY. Thus productivity is not only unknown nor has the impact of this uncertainty actually been explored. Furthermore, as emphasized by the peer reviewer, while species-specific sampling now appears to be in place, there is no attempt in the assessments and MSE to address the uncertainty that could result from fluctuation in redfish species ratios. The team revised its conclusion and SG100 is now not met for this SI. As a result, the score of the PI was downgraded from 100 to 90.</p> <p>SI b: The team concluded that there was no basis for concern with commercial catch estimation for the bottom trawl fishery for Div. 3LN "redfish". The specific-specific sampling in the bottom trawl surveys now provides a defensible basis for estimating depth-stratified commercial catch ratios in the Div. 3LN bottom trawl fishery. There is currently no midwater trawl effort for redfish.</p>
1.2.4	Yes	No	NA	<p>SI a Agree that ASPIC assessment is appropriate for stock, HCR and nature of fishery, given existing data. But an age or length based assessment, if available, would account for more of the biology of</p>	<p>SI a: The team suggests that a length-based assessment approach would probably add little benefit owing to the deterministic growth pattern and long lifespan of <i>Sebastes</i> spp. An age-based</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				the species, such as growth and recruitment. So a score of 80 is perhaps more appropriate here perhaps, as SG100 is not quite met. SI b,c,d,e Agree with scoring and rationale.	assessment would be an improvement and account for more of the biology of the species, if provided with a lengthy matrix of catch- and/or survey-at age proportions. However, the surplus production-APSIC approach used currently for this stock meets a reasonable standard of sophistication in assessment methodology, especially when paired with an MSE.
2.1.1	Yes	Yes	NA	SI a, then c, d Agreed	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Yes	Yes?, perhaps some clarification needed	NA	<p>SI a Agree with score of 100, but ... The text in the justification for this SI refers to “partial strategies” for several species. Does the combination of these partial strategies result in a strategy that meets SG100? If the strategy is indeed partial, then score should be 80.</p> <p>SI b, c. Having some trouble reconciling scores of 100 here with the score of 75 in PI 2.1.3, as it pertains to deep-water redfish. Maybe some further explanation required here, or am I missing something perhaps?</p> <p>SI d Agreed</p>	<p>SI a: the text has been amended with “strategy” as the assessment team considers that there is a strategy in place for managing all retained species.</p> <p>SI b and c: the assessment team agrees with the peer reviewer’s comment. The rationale has been amended to reflect the lack of information specific to the catch of deep-water redfish. As a result the score of the PI was revised to 95.</p>
2.1.3	Yes	Yes	Yes	<p>SI a, b, c, d. Agree with all scoring, rationale and condition. Operation of fishery should be acceptable as partial strategy for blue shark. See note above re scoring of SI b and c in PI 2.1.2.</p>	<p>A response is not necessary.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	Yes	Yes	NA	SI a, b, c . Agree with all scoring and rationale for both UoC . Virtually no by-catch in MW trawl fishery, so 100 is acceptable score for that UoC. For bottom trawl UoC, score of 80 is achieved by meeting SG 80 on SI b and SG 60 on SI c ?	For UoC 1 Bottom trawl, a score of 80 is achieved as all scoring SG60 scoring issues are met as well as all of the SG80 scoring issue b but SG100 scoring issue is not met (CR 27.10.5.2, CR 27.10.5.3).
2.2.2	Yes	Yes	NA	Agree with scoring and rationale for both UoC.	A response is not necessary.
2.2.3	Yes	Yes	NA	Agree with scoring and rationale for both UoC.	A response is not necessary.
2.3.1	Yes	Yes	NA	Agree with scoring, given low bycatch of ETP species. Maybe could add a sentence or 2 on recent slight increasing trend for most wolffish species (indicated in Section 4.4.3)	A sentence on the recent slight increase of most wolffish species in DFO annual research surveys has been added.
2.3.2	Yes	Yes	NA	Agree with scoring and rationale. SG100 not met for SI b, but is met for the other SI in this PI	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	No (but mostly)	Yes	NA	Agree with scoring and justification. For SI c would it be appropriate to include a sentence on the extensive monitoring of wolffish abundance trends through multiple trawl survey indices? Should also note this reference perhaps: DFO 2013. "Report on the Progress of Implementation of the Recovery Strategy for Northern Wolffish and Spotted Wolffish, and Management Plan for Atlantic Wolffish in Canada for the Period 2008-2013." <i>Species at Risk Act Recovery Strategy Report Series. Fisheries and Oceans Canada, Ott., vi + 16.</i>	The following has been added in the rationale for SI c: "Wolffish species abundance trends are extensively monitored through DFO annual trawl surveys."

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.1	Yes	Yes	NA	Agree with score of 80 for btm trawl and 100 for midwater (Maybe even a partial score of 90 warranted for btm trawl??). Not sure how relevant the 0.3% figure is, given that the lower depth range chosen is 100 m, which is a bit shallow for redfish habitat/fishing? This 0.3% figure is repeated a number of times in PIs 2.4.x	A partial score of 90 cannot be assigned to PI 2.4.1. The range of depth considered for the fishery footprint analysis was 100-900 m which is considered to be relevant by the assessment team. According to Figure 12, redfish fishing activities occurs between 200 and 700 m, the depth range chosen for the footprint analysis ensures that the whole area fished by the redfish fleet is being covered.
2.4.2	Yes (mostly)	Yes	NA	For both UoC: SI a Agreed SI b,c,d Agreed. But doesn't the info to show if there is overlap between bottom trawl fishery and VME's exist already? Agree with higher scores for MWT UoC	Some information to show the overlap between bottom trawl fishing and VMEs exists. Studies (Murillo et al 2011; Vinnichenko et al. 2014) have investigated the occurrence and distribution of deep-water corals and sponges in NAFO regulatory areas of Newfoundland based on observations onboard bottom trawl groundfish fishing and surveys vessels. But there was no information specific to the Canada 3LN redfish fishery.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.3	Yes	No	NA	<p>Agree with all scoring and rationale for individual SIs. But shouldn't the overall PI score be 85, not 90, based on page 82 scoring table: "85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100". In this case 2 of 3 do not meet SG100.</p> <p>Could perhaps elaborate a little on the types of data collection continuing in SI c (e.g. observer data on corals/sponges, etc.)</p>	<p>The assessment team agrees with the peer reviewer's comment, As per CR 27.10.5.3iii, the PI score should be 85. Therefore the score was amended accordingly.</p> <p>Rationale for SI was elaborated and a map showing the distribution of deep-water corals of the Flemish Cap, Flemish Pass and the Grand Banks has been added in section 4.4.4.</p>
2.5.1	Yes	No	NA	<p>Agree with 80 for btm trawl UoC. But wouldn't a score of 100 for MWT UoC require evidence? Also perhaps the team meant to score this as 80, given there is a No in the SG100 cell?</p> <p>I could suggest a partial score of 90 for MWT UoC perhaps, based on the obvious lower likelihood of bottom contact/serious harm in the MWT fishery, and very low bycatch.</p>	<p>A partial score of 90 cannot be assigned to PI 2.5.1.</p> <p>The assessment team concludes that the score for mid-water trawl is 100. The rationale has been strengthened to support this score.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.2	Yes (mostly)	Yes (Check SI c)	NA	SI a Agree. Justification should probably include a bit more info on the measures implemented by NAFO also. SI b Agree. SI c Agree with score of 100 as is, but only a score of 80 if it is necessary to have a "plan". The last sentence of the justification says it does not meet SG100 because there is no plan, but SG100 is marked 'yes'. Check scoring/rationale here. SI d. Agree with score of 80.	Rationale has been completed with additional information on NAFO management measures. The assessment team confirms that 100c is not met.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.3	No	Yes	NA	<p>SI a. Agree – clearly meet SG80. Could also reference some trophic studies done, and the work of the NAFO SC WG on Ecosystem. E.g. (as well as some more recent perhaps) NAFO 2013. “Report of the 6th Meeting of the NAFO SC WG on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM].” <i>NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.</i></p> <p>SI b. Agreed</p> <p>SI c, d Agreed, but would suggest a little more detail/evidence in the justification perhaps. This would also help with the justification for SG100 in SI e.</p> <p>SI e. Agreed – there is plenty of information to support development of strategies. Also like the recommendation here.</p> <p>Score of 85 is good for this PI – all SI meet SG80, 3/4 do not meet SG100 (no SG100 available for SI a)</p>	<p>SI a: The rationale has been completed with reference to NAFO work on ecosystems.</p> <p>SI c,d: more details have been added to the rationale.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.1	Yes	Yes	NA	SI a,b,d Agreed Note that the score for this PI differs from 3LNO yellowtail (as per Table 13 on pg 72), for which SG100 was considered to be met for SI d.	The Assessment Team does not find evidence that the Canadian management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood. These rights have been confirmed by court decisions in Canada which were then implemented by the management authority. There is no aspect of fishing for food or livelihood at the NAFO Convention level. This is a matter for individual Contracting Parties. Hence, the No for SI d at the SG 100 level.
3.1.2	Yes	Yes	NA	Agree with all SI scoring and rationale.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	Yes (mostly)	Yes	NA	Agree with scoring. Rationale could perhaps draw clearer links between the objectives and the MSC principles (particularly Principle 2).	<p>Overall, Canada's Sustainable Fisheries Framework, provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada (See p. 59 of the Peer Review Report). These two approaches directly relate to MSC Principle 1 (Sustainable Fish Stock) and Principle 2 (Minimizing Environmental Impact).</p> <p>Likewise, NAFO various objectives (pp. 60-61) provide for Sustainable Fish Stocks and Minimizing Environmental Impact.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.4	Yes (mostly)	Yes	NA	Agree with partial score of 90. Would suggest some text on how some details provided are actually incentives (e.g. 1 company holding 71% of Canadian EA would seem to have incentive to operate responsibly, ensure resource is sustainable, etc.). Also, could be helpful here to link specific incentives with MSC Principles 1 or 2	In essence, the Assessment Team concluded that various management policies or measures at the Canadian domestic and the NAFO Convention level encourage or provide incentives for sustainable fishing and the reduction of excess fishing capacity. The Canadian Groundfish Enterprise Allocation Program is specifically mentioned as one such policy which encourages sustainable fishing practices by removing the "race to the fish". Reducing or eliminating excess fishing effort in a fishery clearly contributes to sustainable fish stocks and reduces environmental impacts.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.1	Yes (mostly)	Yes	Yes	Agree with partial score of 70, based on the IFMP argument. Again, would like to see some text pertaining to the Principle 2 outcomes though.	As indicated on p. 63, the objectives contained in the existing NL Region Groundfish IFMPs (which currently does not specifically include 3LN redfish) contains the following objective: "To mitigate adverse impacts on other species, habitat, and the ecosystem where groundfish fishing occurs, protecting biodiversity and ecosystem structure and function". The Assessment Team was advised that these types of groundfish objectives can be accepted as applying to management of 3LN Redfish. This is clearly an objective that addresses Principle 2 and will be eventually contained in a revised groundfish IFMP that will include 3LN redfish.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes (mostly)	No?	NA	<p>SI a. Agreed</p> <p>SI b. Agreed – does not meet SG100. Rationale should mention approach to settling disputes.</p> <p>SI c. Agreed. Should rationale mention the Canadian PA?</p> <p>SI d. Agreed – falls short of SG100.</p> <p>SI e. Not a crucial point, but why was this SI not scored at SG100, given the rationale describing proactive measures? I recognize that the NAFO system does not appear to operate on legal challenges. If this SI is scored at 100, overall score for this PI changes (to 85 or 90?)</p>	<p>Si a: No Comment necessary.</p> <p>Si b: Dispute settling is dealt with under SI e.</p> <p>SI c: The stock management decisions are made by NAFO, so it's the NAFO PA that applies to this stock and fishery,</p> <p>SI d: No comment necessary.</p> <p>SI e: The Assessment Team agrees as the fishery acts proactively to avoid legal disputes. A Y is now assigned to SG100 and the score of the PI was revised from 80 to 85.</p>

3.2.3	Yes	Yes	NA	<p>SI a. Agreed</p> <p>SI b. Agreed, but does the doubt expressed in para 4 of the justification cause enough concern to lower score to 80? If not, why?</p> <p>SI c. Agree on SG80. Note that this differs from the SG100 level assigned to 3LNO yellowtail for this SI.</p> <p>SI d. Agreed. Compliance appears to be much improved in this fishery compared to 1980s-90's.</p>	<p>SI b: The Assessment Team stated its conclusion on this SI as: "At the Canadian domestic and the NAFO level sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence."</p> <p>SI c: Based on available evidence, the assessment Team stands by its conclusion; "Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery." A high degree of confidence that all fishers comply etc was not seen to be supported.</p> <p>Si d: No comment needed.</p> <p>The overall score for this PI has been adjusted to 85.</p>
3.2.4	Yes	Yes	NA	<p>Agreed. SI b would be closer to 100 than SI a perhaps. Is there a Canadian research plan for its work on this stock? Note the score of 70 for 3LNO yellowtail flounder for this PI.</p>	<p>A written document on 3LN Redfish Research Activities was provided to the Assessment Team during the Site Visit that constitutes DFO's NL Region's Research Plan for science activities regarding 3LN Redfish. Scientific Advice for 3LN Redfish stock management is provided by NAFO's Scientific Council</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					as requested by the Fisheries Commission. The Assessment Team further concluded that "it cannot be said that the research plan is comprehensive as it does not provide a detailed description of each research activities/project and a timeline."
3.2.5	Yes	Yes	NA	SI a Agreed. But should elaborate which parts of the management sytem are not evaluated, thus preventing the 100 score. SI b Agreed.	SI a: It remains unclear as to what degree of annual review is given to other than the stock status, stock assessment methodology and the performance of compliance and enforcement activities. Evaluation of fisheries management system against all fishery specific objectives is not clearly seen to be undertaken. SI b: No comment necessary.

Any Other Comments

Comments: See comments at beginning of this report. I have also added a few comments and suggested corrections to a draft of the assessment	Conformity Assessment Body Response
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<p>report, which are largely editorial, and a copy is attached with this template. I trust these will be of some help.</p>	<p>The assessment team thanks the peer reviewer for providing comments and suggesting corrections directly within the report, it was helpful to improve the quality of the assessment report.</p>
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Peer Reviewer 2's comments

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Conformity Assessment Body Response
<p><u>Justification:</u> Despite the suggested clarifications and few re-scoring points raised in this peer review, the conclusion is that this fishery meets the basic MSC criteria with the two conditions drafted by the assessment team. The mid-water trawl P2 impact information is not current but given the knowledge of the gear in general terms, the small size of the fishery and the intensive monitoring program, one can accept the conclusion of the assessment team that the catch composition in the older data would generally represent the catch of the present day. It might be wise to recommend 100% observer monitoring when mid-water trawl is re-introduced, just to be sure.</p>		<p>The team agrees that should mid-water trawling for Div. 3LN redfish recommence, then catches should be monitored adequately (as stated is Recommendation1), however 100% coverage may not necessarily be required.</p>

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Conformity Assessment Body Response
<p><u>Justification:</u> The conditions are written per the certification requirements version 1.3 section 27.11.</p>		<p>A response is not necessary.</p>

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Conformity Assessment Body Response
<p><u>Justification:</u> The client action plan follows the certification requirements version 1.3 section 27.11. To facilitate clarity during annual surveillance audits, the action plan should include a statement of commitment from DFO instead of just "DFO".</p>		<p>Two emails from DFO showing DFO's agreement and support on conditions and associated milestones are included in the assessment report below Tables A1.3 and B1.3.</p>

General Comments on the Assessment Report (optional)

Performance Indicator Review

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	There is a high degree of certainty of being above the point of recruitment failure and being at the target reference point, and this status has endured for a number of years suggesting a stable and effective management system. The scoring is correct.	A response is not necessary.
1.1.2	Yes	Yes	NA	Reference points are clearly defined and set above the level where there is risk of impairing reproductive capacity using precautionary rules of probability. Scoring is correct.	A response is not necessary.
1.1.3	Yes	Yes	NA	Not scored is appropriate.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	Yes	No	NA	Given that there is presently no stated strategy to define actions for a stock approaching an LRF, it is overly generous to conclude the fishery meets the SG100 scoring issue for scoring issue "a" where the strategy is "designed" to achieve objectives reflected in the target and limit reference points. It is agreed that "b", "c" and "d" are met.	1.2.1. a The team notes that a Div. 3LN redfish specific harvest strategy has now been adopted (NAFO 2016a) to address the problem noted by the reviewer. A summary of the harvest strategy has now been added to the document. This was not present in the earlier version of the team's document seen by the reviewer.

1.2.2	No	No	NA	<p>There is an inconsistency between the criteria requirement of SI “a” that: “Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.” And the assessment conclusion that: “While there is no specific harvest control rule that directly links a choice of TAC to negative change in a survey index, the combination of the frequent re-calculation of status of the stock, the NAFO PA, adequate catch monitoring and compliance provides an adequate suite of components to ensure that exploitation rates are reduced as the stock declines in absolute and/or relative abundance. “ The fact is that the HCR is not in place to define actions if the stock status is reduced. Therefore the scoring issue is not met at the SG80 or the SG100 level. A condition would be appropriate to ensure this HCR is included in the stratgey.</p>	<p>As noted above for 1.2.1., the team notes that the reviewer’s concerns have now been met by the Div. 3LN redfish-specific harvest strategy outlined in NAFO 2016a and summarized above. This development was not included in the previous version of the team document seen by the peer reviewer.</p> <p>The team also noted that while the HC is not directly linked to a survey index, the 2-y frequency of the assessments, which are tuned by numerous ongoing surveys, will provide frequent updates on the trends in stock biomass and, more importantly, provide bi-ennial updates on the status of the stock with respect to NAFO status categories.</p> <p>If the assessments become less frequent, then NAFO could consider linking HC directly to survey indices, to improve the response time of management.</p>
1.2.3	No	No	NA	<p>The scoring issue “c” is not met at SG80 since there is no catch data available of the two components of redfish in other fisheries. This may be inferred from the surveys but this does not meet the scoring criteria. This needs clarification or rescoreing.</p>	<p>1.2.3. c.The team disagrees with the reviewer. If the spring and fall CDN bottom trawl surveys continue to provide depth and, potentially, spatially stratified estimatates of species proportions in the surveys then these provide a defensible basis for estimating the catch of each species in other fisheries and gear types. Should other gear types, including mid-water trawl begin to account for significant porportions of the 3LN redfish catch, the assumption of compariabiity in redfish species</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					ratios may require study. A comment to this effect has been added. Results of the fall 2015 sampling have been added to the main background narrative.

1.2.4	No	No	NA	<p>The assessment team suggests that new sampling to determine relative abundance of the two species will allow more accurate survey indices and catch estimates. However these new sampling techniques are not yet in place and cannot be assessed here. It would seem, therefore that the fishery does not meet the SG100 requirement of SI "a" that the harvest control rule takes into account the major features relevant to the biology of the species, which surely includes species determination.</p> <p>Likewise, there is insufficient evidence to conclude that SI "c" is met at the SG100 level since the MSE is provided in the case of increasing the TAC, not decreasing it. The suggestion that new species sampling "should provide notification of any significant shifts" is not evidence that it actually does provide such notification. This remains to be seen and therefore the SI is not met.</p>	<p>1.2.4.a. The team disagrees with the reviewers comment. The team acknowledges that this review which treats Acadian redfish as the P1 species, effectively treats the NAFO assessment and HS which although referring to the complex, adequately addresses the management of Acadian redfish and therefore meets the SG 100 level. A rebound in deep-sea redfish could confound the management of Acadian redfish, however there is no current evidence that this will occur, and should it occur, it will be noted in the species specific sampling which is now in place. In response to reviewer's comments, the analyses of the 2015 data are now included in the overall narrative section to show how the species proportions can and have been calculated by depth strata.</p> <p>Furthermore, note the conditions that have been attached with respect to future assessment of status of the status of deep-sea redfish now that the data are not being collected that could be used to support these assessments.</p> <p>SI c. The team suggests that the MSE which explores directly the impact of increasing the the TAC is appropriate since the starting harvest was conservative with respect to the 2014 assessment. Secondly, as now noted above, there is now a Div. 3LN redfish species harvest strategy explicitly designed to address a change of biomass to a lower status. Furthermore, the 2014 MSE conclusions were re-examined in the 2016 assessment. These indicate that stock status should continue to be above Bmsy through 2017. Finally, the biennial assessment schedule should allow the harvest to be decreased quickly in response to declining trends in the stock to sudden changes in the trend, or changes to a lower NAFO status category.</p>
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Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.
2.1.2	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	The scoring has been revised to 95 reflect the lack of catch data specific to the deep-water redfish.
2.1.3	Yes	Yes	Yes	The scoring is consistent with the criteria for this PI.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	No	No	NA	<p>Bottom trawl: There is no supporting data to conclude that blue shark should be included in the bycatch of this fishery. The catch is less than 5% and no arguments have been provided to suggest why it is particularly vulnerable to this gear. Should score 100. (GCB 3.8.2)</p> <p>Midwater: No bycatch species have been identified on the text for this UoC. The scoring is consistent with the criteria for this PI.</p>	<p>The assessment team disagrees. The section 4.4.2 explains that "According to MSC guidance to CR, a species may normally considered as main if it comprises 5% or more of the total catch in weight. Species comprising less than 5% of total catch may normally considered as minor, unless it is particular vulnerability or if the total catch of the fishery is large." Although the catch is less than 5%, the assessment team considers blue shark as main bycatch species because of its vulnerability. Vulnerable does not mean vulnerable to fishing gears but vulnerable because of its biological characteristics and its population abundance trend. The inherent vulnerability of sharks is well documented and is due to their low productivity which is a result of their low fecundity and late age at sexual maturation. This clarification has been added in section 4.4.2</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.2	No	No	NA	<p>Bottom trawl: There is no supporting data to conclude that blue shark should be included in the bycatch of this fishery. The catch is less than 5% and no arguments have been provided to suggest why it is particularly vulnerable to this gear. Should score 100. (GCB 3.9)</p> <p>Midwater: The scoring against the criteria is correct and recognizes the lack of testing and clear evidence required for meeting the SG100 scoring issues since there is currently no fishery in place using mid-water trawl.</p>	<p>The assessment team disagrees. The section 4.4.2 explains that "According to MSC guidance to CR, a species may normally considered as main if it comprises 5% or more of the total catch in weight. Species comprising less than 5% of total catch may normally considered as minor, unless it is particular vulnerability or if the total catch of the fishery is large." Although the catch is less than 5%, the assessment team considers blue shark as main bycatch species because of its vulnerability. Vulnerable does not mean vulnerable to fishing gears but vulnerable because of its biological characteristics and its population abundance trend. The inherent vulnerability of sharks is well documented and is due to their low productivity which is a result of their low fecundity and late age at sexual maturation. This clarification has been added in section 4.4.2</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.3	No	No	NA	<p>Bottom trawl: There is no supporting evidence (data or argument) to include blue shark in bycatch calculations. The fishery should meet the SG100 scoring issues for this PI.</p> <p>Midwater: The scoring against the criteria is correct and recognizes the lack of recent information required for meeting the SG100 scoring issues since there is currently no fishery in place using mid-water trawl.</p>	<p>The assessment team disagrees. The section 4.4.2 explains that "According to MSC guidance to CR, a species may normally considered as main if it comprises 5% or more of the total catch in weight. Species comprising less than 5% of total catch may normally considered as minor, unless it is particular vulnerability or if the total catch of the fishery is large." Although the catch is less than 5%, the assessment team considers blue shark as main bycatch species because of its vulnerability. Vulnerable does not mean vulnerable to fishing gears but vulnerable because of its biological characteristics and its population abundance trend. The inherent vulnerability of sharks is well documented and is due to their low productivity which is a result of their low fecundity and late age at sexual maturation. This clarification has been added in section 4.4.2</p>
2.3.1	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.2	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.
2.3.3	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.
2.4.1	Yes	Yes	NA	Bottom Trawl: The scoring is consistent with the criteria for this PI. Midwater: The scoring is consistent with the criteria for this PI.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Yes	Yes	NA	<p>Bottom Trawl: The scoring is consistent with the criteria for this PI.</p> <p>Midwater: In each of the four SI, the assessment team observe that midwater trawl gear interaction with the sea floor is exceptional, which is correct, but then add that "observer record catches of coral and sponges." (??) I don't see this mentioned in section 4.4.4 and it seems inconsistent with the observation that the gear only rarely touches the bottom. This needs clarification.</p>	The assessment team thanks the peer reviewer for that comment. It was an error and the rationale have been amended to reflect the fact that deep-water coral and sponges catches have not been observed.
2.4.3	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.1	Yes	Yes	NA	<p>Bottom Trawl: The scoring is consistent with the criteria for this PI.</p> <p>Midwater: The scoring is consistent with the criteria for this PI.</p>	A response is not necessary.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.2	Yes	No	NA	<p>SI "b": There is no comment supporting the "No" conclusion for SG100. Presumably the team concluded the SI was not met because there is no plan.</p> <p>SI "c": The justification does not support the score and it appears this might be the justification for SI "b", not "c". Needs revision.</p> <p>SI "d": The SG100 criteria do not require a plan, only some evidence that measures are being implemented successfully. The justification needs a comment in this regard to support the score.</p> <p>If SI "c" is met at the SG100 level, as suggested the score would be 85, not 80.</p>	<p>SI b: SG100 is not met because there is no strategy that consists of a plan in place.</p> <p>SI c: the SG100 is not met, Y was an error and it has been corrected. The assessment team disagrees as the rationale provided for SI b and c are different and support the requirements of each SI.</p> <p>SI d: The assessment team disagrees as at the SG100 level, it's the measures part of the strategy that consists in a plan that have to be considered whereas SG80 is related to the measures comprising the partial strategy.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.3	Yes	No	NA	I'm not sure why the team includes comments concerning the Gulf of St. Lawrence and the Scotian Shelf in this PI and 2.5.1. It seems irrelevant to 3LN unless a clarification can be made to connect the two. SI "d": this needs a comment to support the conclusion on "N" for SG100.	The reference to Gulf of St Lawrence and Scotian Shel has been removed from 2.5.1 and 2.5.3. The following has been addeed to SI c to justify a N for GS100: "However, the monitoring of the redfish species composition in commercial catches and DFO annual research survey has been recently implemented and it is not possible to confirm that the main functions of these components are understood, preventing the fishery from meeting SG100."

3.1.1	No	No	NA	<p>SI “b”: The justification needs a link to why the SG100 is not met.</p> <p>SI “d”: I would conclude the SI is met at SG100 and observe that the justice system is part of the of the management system being assessed and provides the formal commitment protecting the rights of people dependent on fishing for food and livelihood as required by the PI. The Marshall and Sparrow decisions provide evidence.</p>	<p>SI “b”: It is not clear what is meant by a link to why this SI is not met. The Assessment Team, based on the available evidence, concluded that “The management system incorporates or is subject by law to a transparent_mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.” It further concluded by implication that “there is not 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. The main failing in this instance is the lack of a modern international dispute mechanism in the NAFO Convention. Moreover, the Team is of the view that the Canadian national legal system, while it can be used to sue for redress of management decisions, that this is not the same as a mechanism or arrangement that is part of the management system itself such as a licensing and allocation tribunal for example.</p> <p>SI “d”: The Assessment Team draws a different conclusion on this SI. It concludes that the Canadian fishery management system does not has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood. These have been confirmed by court decisions in Canada which were then implemented by the management authority. There is no aspect of fishing for food or livelihood</p>
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Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					at the NAFO Convention level. This is a matter for individual Contracting Parties. Hence, the No for SI d at the SG 100 level.
3.1.2	Yes	No	NA	SI "b": It would be useful to provide some evidence that the domestic consultation process demonstrates consideration of information and explains how it is (and particularly) not used. Without such evidence I suggest the SG100 SI is not entirely met.	SI "b": The Assessment Team scored this PI in the context of the 3LN Redfish Management system where the main use of information takes place at the NAFO Fisheries Commission and the Scientific Council. Management decisions are taken in the Fisheries Commission after debate by all Contracting Parties in the presence of NGO observers. The results of these deliberations are published in the Annual Report of the Fisheries Commission and reflect the extent to which all available information and advice was considered, accepted or rejected.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	Yes	Yes	NA	The template is in error for definition of the Guidepost for SG80. Needs revision.	The wording of SG80 has been corrected.
3.1.4	Yes	Yes	NA	The scoring is consistent with the criteria for this PI.	A response is not necessary.
3.2.1	Yes	Yes	Yes	The scoring is consistent with the criteria for this PI.	A response is not necessary.
3.2.2	Yes	No	NA	SI "b" justification needs a link to the specific evidence that SG100 is not met. SI "e" justification needs a link to the specific evidence that SG100 is not met.	SI "b": The difference in this instance is the lack of clear evidence that all identified issues as opposed to serious and other important issues are responded to. Hence the conclusion that SG 100 is not met. SI "e": The Assessment Team revised the scoring as the fishery acts proactively to avoid legal disputes. A Y is now assigned to SG100 and the score of the PI was revised from 80 to 85.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Yes	No	NA	<p>SI "b": The justification includes "some doubt whether sanctions are always consistently applied and demonstrably provide effective deterrence". It is unclear if this comment is directed towards NAFO or to Canada but, if included, would suggest the SG100 is not met</p> <p>SI "c": The justification includes a statement about the 2014 Compliance Report (presumably of NAFO) and the lack of confidence that all fishers comply with the management system. I would suggest the team assess only the degree to which the fishers under the present assessment comply with the NAFO management measures and the Canadian management measures since the other fishers are not included in the present assessment. The SG100 issue may be met.</p>	<p>SI b: The Assessment Team, based on available evidence, stated its conclusion on this SI as: "At the Canadian domestic and the NAFO level sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence." Therefore the fishery meets SG80 but not SG100. The overall score for this PI has been adjusted to 85.</p> <p>SI "c": The Assessment Team concluded that the available evidence indicates that there is not a high degree of confidence that all fishers comply with the overall NAFO management measures. Without 100 percent observer coverage it cannot be said that there is a high degree of confidence that Canadian vessel(s) comply with all management measures all of the time.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	Yes	No	NA	SI "b": The justification for not meeting SG100 needs some elaboration since all Canadian research results are publically available on CSAS. Perhaps the lack of a publically available research plan prevents the SI from being met in entirety.	SI "b": The assessment team stated that" The fishery does not meet SG100 as it cannot be said that the research plan and all results are widely and publically available." Hence the reason for this SG not meeting 100.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.5	No	No	NA	<p>SI "a": The justification does not provide a link to evidence that the SG100 is not met.</p> <p>SI "b" SG80: I suggest the annual checklist provides a regular internal review and the occasional external review may be conducted by the House of Commons Standing Committee on Fisheries. The fact that the checklist was not available to the assessment team is problematic since this provides the evidence but the SI does not specifically require the evidence, only the assurance that the system is subject to review.</p> <p>The justification does not provide a link to evidence that the SG100 is not met.</p>	<p>SI a: It remains unclear as to what degree of annual review is given to other than the stock status, stock assessment methodology and the performance of compliance and enforcement activities. Evaluation of the overall fisheries management system against all fishery specific objectives is not clearly seen to be undertaken.</p> <p>SI "b": While accepting the point re the Fishery Checklist the fact remains that the management system is not subject to both regular internal and external review. Therefore, the conclusion that the management system is subject to regular internal and occasional external review stands.</p>

Any Other Comments

Comments	Conformity Assessment Body Response
<p>The data for assessing mid-water trawl P2 impacts is 15 years old in a dynamic system that has seen some changes since 1999. If this was a different gear type, such as pelagic longline, I would be deeply concerned. The fact that the UoC uses mid-water trawl, a gear that fishes relatively clean, allows me to accept the conclusions drawn by the assessment team. It also helps that there are so few vessels involved in this UoC and that monitoring provides confidence that any issues will be known when, and if, the gear is re-introduced.</p>	<p>The assessment team agrees. There are three vessels involved in the redfish fishery and monitoring is in place to ensure that target species, retained and bycatches species catches, and ETP species interactions will be available in the event that mid-water trawl is re-introduced.</p>

Appendix 3. Stakeholder submissions

Ecological Action Centre



Ecology Action Centre



tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

Orla Minogue
SAI Global Assurance Services
Orla.Minogue@saiglobal.com

August 4, 2015

Dear Ms. Minogue,

Re: Comments on MSC Certification of the 3LN redfish fishery

The Ecology Action Centre is one of Atlantic Canada's largest and oldest conservation organization. Our marine program works at the local, regional, national and international levels to secure marine conservation outcomes. We have a long history of engaging on MSC certification, as well as with the Atlantic Canadian groundfish fleet. We are currently members of the Scotia-Fundy Groundfish Advisory Committee and we advocate for population rebuilding and stewardship of marine fish populations that are in decline. We are also founding members of SeaChoice, Canada's Sustainable Seafood program where we work with retail partners to improve their seafood purchasing practices. We are submitting our comments as the Ecology Action Centre as well as on behalf of SeaChoice.

Principle 1 issues:

Our main concern related to this fishery is the fact that 3LN redfish actually is comprised of two different redfish species, the Acadian Redfish (*Sebastes fasciatus*) and the Deepwater Redfish (*Sebastes mentella*). Both of these species have been assessed as Threatened by COSEWIC (COSEWIC 2010). We believe that further data, which distinguishes between the two species must be utilized in this fishery in order to assess the true impacts.

The two redfish species have not been regularly separated in fisheries statistics, in stock assessments, and in management plans. Catches are reported as "redfish," without any differentiation, and quotas are set for their combined catch. The most recent NAFO stock assessment was for a species complex "redfish" with no separation of trend data by species (NAFO SCR 14/006, 14/022). However, in its assessments, COSEWIC was able to determine trends for both species, using species specific data on abundance trends and distribution.

The abundance of redfish in 3LN has increased considerably since the COSEWIC assessment in 2010. However, the available data do not allow one to determine which species has increased, or if both have increased. Therefore it is critical to use delineate impacts on both species in order to gain a full understanding on the impacts of the fishery related to P1. If rebuilding is not occurring for both species, we do not believe the fishery should be certified.

We also urge the assessment team to carefully consider the 2010 COSEWIC assessment. While redfish are not currently listed under the Species at Risk Act, they are being considered at this moment. In addition, DFO has not challenged the scientific validity of the COSEWIC findings. We believe that MSC's failure to consider COSEWIC assessed species-at-risk as ETP species is a significant weakness within the system, and creates the potential for certified to negatively impact vulnerable species. Considering this fishery targets a species-at-risk, we encourage the assessment team to require the use of complete precautionary reference points (limit, target and upper) in this fishery, as well as additional tools to promote rebuilding, prior to certification.

Principle 2 issues:

Species at Risk

There are several SARA listed species that might be affected by this fishery; North Atlantic right whale, blue whale, leatherback turtle, northern wolfish, and spotted Wolfish. We request that the assessment team closely examine the fishery's impact on these species, and require strict protection and monitoring plans are already in place before certification proceeds.

In addition, there are several other species that have been assessed as Endangered or Threatened by COSEWIC but that have not been SARA listed that might be affected by this fishery:

- Atlantic cod
- American plaice
- thorny skate
- smooth skate
- winter skate
- white hake
- cusk

We request that the assessment team consider these primary bycatch species because of their vulnerable status, ensure that the fishery is not having adverse impacts on them, and that rebuilding strategies are being implemented.

Sensitive Benthic Habitat

Redfish tend to dwell in areas of structured habitat, where there are current breaks, which often overlaps with areas of sensitive benthic habitat with coral and sponge concentrations. These areas have been well mapped in the northwest Atlantic, both in Canadian and international waters (the Northwest Atlantic Fisheries Organization has identified these areas as "vulnerable marine ecosystems"). As bottom trawling has damaging impacts on this habitat, we request that the fishery disclose its fishing footprint, and develop a plan to protect know sensitive benthic areas, prior to certification. Work has been done to protect these areas in the NAFO Convention Area, and the Canadian government has a Sensitive Benthic Areas policy (adopted in 2009). Unfortunately there has been very limited implementation of the Sensitive Benthic Areas policy in Canadian waters and we are concerned that this fishery may damaging

sponges and corals in our waters. We hope that MSC will raise the bar regarding ecosystem considerations in this fishery, through conditions related to benthic habitat.

Thank you for the opportunity to provide input. Let us know if you require additional information.

Sincerely,



Catharine Grant
Marine Policy and Certification Coordinator

ecologyaction.ca  

 Ecology Action Centre

Assessment team's response

Catherine Grant
Marine Policy and Certification Coordinator
Ecological Action Centre
2705 Fern Lane
Halifax, NS, B3K 4L3

Re: Ecological Action Centre Submission regarding the MSC full assessment of the Canada 3LN redfish fishery

Dear Catherine,

The assessment team appointed to conduct the MSC full assessment of the Canada 3LN redfish fishery has reviewed your submission and discussed the concerns you have raised in relation to redfish species stock status, the impacts on ETP species, on non-target non ETP species and the impacts on sensitive benthic habitats. We do take your concerns seriously and would like to make the following responses.

Principle 1 issues:

Our main concern related to this fishery is the fact that 3LN redfish actually is comprised of two different redfish species, the Acadian Redfish (*Sebastes fasciatus*) and the Deepwater Redfish (*Sebastes mentella*). Both of these species have been assessed as Threatened by COSEWIC (COSEWIC 2010). We believe that further data, which distinguishes between the two species must be utilized in this fishery in order to assess the true impacts.

The two redfish species have not been regularly separated in fisheries statistics, in stock assessments, and in management plans. Catches are reported as "redfish," without any differentiation, and quotas are set for their combined catch. The most recent NAFO stock assessment was for a species complex "redfish" with no separation of trend data by species (NAFO SCR 14/006, 14/022). However, in its assessments, COSEWIC was able to determine trends for both species, using species specific data on abundance trends and distribution.

The abundance of redfish in 3LN has increased considerably since the COSEWIC assessment in 2010. However, the available data do not allow one to determine which species has increased, or if both have increased. Therefore it is critical to use delineate impacts on both species in order to gain a full understanding on the impacts of the fishery related to P1. If rebuilding is not occurring for both species, we do not believe the fishery should be certified.

In order to identify the two redfish species and evaluate their abundance trend, the DFO research survey sampling was modified beginning with the 2015 fall survey to provide species-specific sampling. This sampling has also been carried out onboard Canadian redfish fishing vessels. The full explanation of the sampling is provided in section 4.3.1.1 at p26-28 of the assessment report. The initial results of this sampling show very different ratios of at each depth stratum than those based on Ni (1982)³² which were used to estimate biomass trend of *S. fasciatus* and *S. mentella* in the COSEWIC 2010 assessment. Samples collected in the autumn survey in 2015 showed higher proportions of *S. fasciatus* for all depth strata. From a conservative perspective, > 90 % of the total catch would be *S. fasciatus*.

³² Ni, I-H. 1982. Meristic variation in beaked redfishes, *Sebastes mentella* and *S. fasciatus*, in the Northwest Atlantic. Can. J. Fish. Aquat. Sci. 39: 1664- 1685.

In summary, the 2015 survey result indicates that the *S. fasciatus* dominates in all but the deepest stratum where redfish catch rates were very low. Even in that stratum, one of the two samples was classified as *S. fasciatus*. Thus since most of the Canadian fishery takes place in < 600 m, the Canadian catch must be strongly dominated by *S. fasciatus*.

In light of these results, SAIG has requested in June 2016 a variation to change the initial UoCs (target species) and assessment tree to be used, which was accepted. The target species is now *S. fasciatus* rather than the stock complex, *S. mentella* being considered as an Inseparable or Practicably Inseparable (IPI) stock (MSC CR 27.4.9) and assessed under Principle 2 as a main retained species, and the assessment tree to be used is the default assessment tree.

In order to ensure that the redfish species-specific monitoring continues to be carried out, the assessment team raised a condition requiring the client to provide evidence that the redfish species-specific monitoring continue to be carried out and the results to be analyzed and presented. In addition, a recommendation was made that an analytical effort now be directed to using these data to monitor trends of each redfish species to help ensure that managing to the level of complex does not place the individual redfish species at risk.

We also urge the assessment team to carefully consider the 2010 COSEWIC assessment. While redfish are not currently listed under the Species at Risk Act, they are being considered at this moment. In addition, DFO has not challenged the scientific validity of the COSEWIC findings. We believe that MSC's failure to consider COSEWIC assessed species-at-risk as ETP species is a significant weakness within the system, and creates the potential for certified to negatively impact vulnerable species. Considering this fishery targets a species-at-risk, we encourage the assessment team to require the use of complete precautionary reference points (limit, target and upper) in this fishery, as well as additional tools to promote rebuilding, prior to certification.

Although considered by the assessment team, the 2010 COSEWIC assessment was not used to evaluate the status of *S. fasciatus* and *S. mentella* as it was based on assumption that the depth-specific species ratios of the two redfish species had remained equal to that observed in samples collected prior to the beginning of survey (i.e. prior to 1991). This assumption was invalidated by the results of the redfish species-specific monitoring in the 2015 DFO fall research survey and commercial catches, which showed higher proportions of *S. fasciatus* for all depth strata.

The assessment team is required to comply with the MSC fisheries Certification Requirements and based on the definition of an ETP species, redfish species are not considered as ETP species. The assessment team carefully reviewed the results of the redfish species-specific monitoring in the 2015 DFO fall research survey and commercial catches and of the 2016 NAFO stock assessment for redfish in 3LN, as well as the harvest strategy in place and the measures in place to ensure that the fishery does not hinder the recovery of Principle 2 species.

The assessment team determined that current harvest strategy for the 3LN redfish includes a comprehensive combination of strategic elements including a precautionary harvest policy, catch and abundance monitoring, biennial stock assessments, harvest control rules and management actions that includes an explicit management plan tested by a management strategy evaluation (MSE), as well as appropriate reference points. The standard NAFO policy indicates target biomass is B_{msy} , B_{buf} equals 40% of unfished biomass, and B_{lim} equals 20% of unfished biomass. However, for assessments that use Schaeffer surplus models similar to that used for the 2016 and earlier Div. 3LN redfish assessments, a NAFO study group (2004) recommended using a B_{lim} of 30% B_{msy} . The reference points are, in general, consistent with international convention and represent NAFO policy. However, reference points are explicitly estimated for Div. 3LN redfish, and work by Duplisea et al. (2012) on other redfish stocks indicated that 40% B_{msy} might be more appropriate from *S. fasciatus*.

Principle 2 issues:

Species at Risk

There are several SARA listed species that might be affected by this fishery; North Atlantic right whale, blue whale, leatherback turtle, northern wolffish, and spotted Wolffish. We request that the assessment team closely examine the fishery's impact on these species, and require strict protection and monitoring plans are already in place before certification proceeds.

In addition, there are several other species that have been assessed as Endangered or Threatened by COSEWIC but that have not been SARA listed that might be affected by this fishery:

- Atlantic cod
- American plaice
- thorny skate
- smooth skate
- winter skate
- white hake
- cusk

We request that the assessment team consider these primary bycatch species because of their vulnerable status, ensure that the fishery is not having adverse impacts on them, and that rebuilding strategies are being implemented.

The assessment team closely examined the fishery impacts on ETP species. All the species mentioned in your letter are listed in section 4.4.3 of the assessment report.

There were no reported and observed interactions with marine mammals and leatherback turtles for the Canada 3LN redfish fishery.

Critical habitats (feeding grounds) for the North Atlantic right whales are the coastal waters of the southeastern United States; the Great South Channel; Jordan Basin; Georges Basin along the northeastern edge of Georges Bank; Cape Cod and Massachusetts Bays; the Bay of Fundy; and the and the Roseway Basin on the Scotian Shelf; fishing-related mortality being mainly caused by fixed gears³³.

According to DFO 2012³⁴ three primary areas of leatherback's important habitat were identified including the southeastern Gulf of St. Lawrence and waters off Eastern Cape Breton Island, including Sydney Bight, the Cabot Strait, portions of the Magdalen Shallows and adjacent portions of the Laurentian Channel, the relative probability of residency of leatherbacks in Div. 3LN being very low.

The assessment team informed the wolffish species catches for the Canada 3LN redfish and determined that the fishery does not hinder the recovery of wolffish species. The last Science Advisory Report was for wolffish in the Atlantic and Arctic regions was published in 2013³⁵. In recent years, there was a very gradual increase in catch rates of Northern wolffish during the DFO spring research survey in NAFO Div. 3LNO, and during the fall survey in Div. 3LN. In recent years, during the DFO fall research survey in Div. 2J3K and Div. 3LNO, catch rates of spotted wolffish were generally increasing.

The assessment team also closely examined the fishery impacts on non-target non-ETP species. Retained and bycatch species are listed in section 4.4.1 and 4.4.2 of the assessment report, respectively. Although catches are below 5% of the total catch, the assessment team considered the

³³ http://www.nmfs.noaa.gov/pr/sars/pdf/atlantic2015_final.pdf

³⁴ DFO 2012. Using Satellite Tracking Data to Define Important Habitat for Leatherback Turtles in Atlantic Canada. DFO Can. Advis. Sec. Sci. Advis. Rep. 2012/036.

³⁵ DFO. 2013. Wolffish in the Atlantic and Arctic regions. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/005.

following species as main retained species because of their vulnerability: the deep-water redfish, the American plaice, the Atlantic cod, the witch flounder and the roundnose grenadier. Cusk has not been recorded and observed in catches.

The assessment team determined that there is an effective partial strategy (SG80) in place to ensure that the fishery does not hinder the recovery of the main retained species. Monitoring is in place to show that catches are well below the incidental catch limit, and most of these species show biomass increasing trends although still below B_{lim} .

Although catches are below 5% of the total catch, the assessment team considered the blue shark as main bycatch species because of its vulnerability.

The assessment team determined that the fishery does not hinder the recovery of the blue shark. Monitoring is in place to show that catches are below 0.5% of the total catch. In recent years, almost all the mortality can be attributed to hooking and post-release mortality in pelagic longlines, and the fishing-related mortality in Canadian waters appear to be sustainable (Campana et al 2015³⁶).

Sensitive Benthic Habitat

Redfish tend to dwell in areas of structured habitat, where there are current breaks, which often overlaps with areas of sensitive benthic habitat with coral and sponge concentrations. These areas have been well mapped in the northwest Atlantic, both in Canadian and international waters (the Northwest Atlantic Fisheries Organization has identified these areas as "vulnerable marine ecosystems"). As bottom trawling has damaging impacts on this habitat, we request that the fishery disclose its fishing footprint, and develop a plan to protect know sensitive benthic areas, prior to certification. Work has been done to protect these areas in the NAFO Convention Area, and the Canadian government has a Sensitive Benthic Areas policy (adopted in 2009). Unfortunately there has been very limited implementation of the Sensitive Benthic Areas policy in Canadian waters and we are concerned that this fishery may damaging sponges and corals in our waters. We hope that MSC will raise the bar regarding ecosystem considerations in this fishery, through conditions related to benthic habitat.

The annual footprint of the Canada 3LN redfish was calculated for the period 2011-2014³⁷. Details are provided in the section 4.4.4 of the assessment report. In summary, the analysis show that most of the redfish fishing activity occurs on muddy sand and sandy mud sea bottoms. Worst-case estimates of swept area based on door-to-door widths suggest that only 0.3% of the total sea area of 36,058 NM2 area (3LN within 100-900 meter depth) was swept on an annual basis. In addition, observer results for 2013 and 2014 indicate that no coral and sponges were present in the commercial catch.

The vessels participating in the redfish fishery are equipped with semi-pelagic doors to allow a portion of the sweep line off the bottom. It reduces the physical footprint of the gear reducing the impact on the benthic habitats.

We hope that these responses have dealt with EAC's comments and concerns.

³⁶ Campana, S.E., Fowler, M., Houlihan, D., Joyce, W., Showell, M., Miri, C., and Simpson, M. 2015. Current Status and Threats to the North Atlantic Blue Shark (*Prionace glauca*) Population in Atlantic Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/026. v + 44 p.

³⁷ Spatialanalysis 2015. Footprint of the Canada 3LN redfish fishery 2011-2014. Main Report and Tables. Prepared for GEAC, June 2015.

Thank you, once again, for having taken the time to communicate with the assessment team on this matter.

Yours Sincerely,

A handwritten signature in blue ink, appearing to be 'G. Criquet', with a stylized flourish at the end.

Géraldine Criquet

Fisheries Team Leader

SAI Global

EMEA Region

Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland

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Contact Information Make sure you submit your full contact details at the first phase you participate in a specific assessment process, subsequent participation will only need your name unless these details have changed.					
Contact Name		<i>First</i> Bruce		<i>Last</i> Atkinson	
Title		Interested Individual (formerly with DFO Science - NL Region (retired))			
<i>On behalf of (organisation, company, government agency, etc.) – if applicable</i>					
Organisation		<i>Please enter the legal or registered name of your organisation or company.</i>			
Department					
Position		<i>Please indicate the position or function you exert within your organisation or company.</i>			
Description		<i>Please provide a short description of your organization.</i>			
Mailing Address, Country		31 Markland St. St. John's, NL A1E4A8 CANADA			
Tel	+ 1 (709) 368-9982	Mob	+ 1 (709) 690-2734	Fax	+
Email	dbruce.atkinson@me.com			Web	

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Public review of the draft assessment report <i>Opportunity to review and comment on the draft report, including the scoring of the fishery</i>	Canada 3LN Redfish Fishery	March 6, 2017	Bruce Atkinson

I wish to comment on the evaluation of the fishery against specific Performance Indicators.
A table with these indicators and the scores and rationales provided by certifiers can be found as an appendix to the report.

Nature of comment *(Please code below)*

1. I do not believe all the relevant information² available has been used to score this performance indicator *(please provide details and rationale)*
2. I do not think the information and/or rationale used to score this performance indicator is adequate to support the given score² *(please provide details and rationale)*
3. I do not believe the condition(s) set for this performance indicator are adequate to improve the fishery's performance to the SG80 level² *(please provide details and rationale)*
4. Other *(please specify)*

2.1.3	3	The Condition (Table A1.3: Condition 1) states: "The client must provide evidence that sufficient data continue to be collected to detect any increase in risk level to deep-water redfish." This assumes that the catches of <i>S. mentella</i> will remain <15% as required in CR 27.4.9.1 (c). There is no consideration of the possibility or consequences of the <i>S. mentella</i> catch rising to >15% and the implications regarding the application of the revised assessment tree with <i>S. mentella</i> as an IPI species. The Condition should include ongoing consideration of the possible proportion of <i>S. mentella</i> in the commercial catches.
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ATTACHMENT 1:

Section 4.3.1.1; Species Composition. It is stated: "The previously assumed species composition of Div. 3LN redfish is based on Ni (1982). Depth distribution of *S. mentella* by this method is presented in (Table 7). It is clear that *S. mentella* was expected to be the dominant species beyond 365 m of depth. However results collected in the fall of 2015 indicate that depths less than 600 meters are, in fact, dominated by *S. fasciatus*. Furthermore, the sampling suggests that *S. mentella* actually comprises significantly less of the biomass than anticipated, as indicated by a very low proportion of samples with AFC counts greater than 8 across all depths and an absence of samples available beyond 650 m of depth. It is clear that *S. fasciatus* comprises a much larger proportion of the biomass than would be expected based on Ni (1982). Furthermore, there is no reason to assume commercial catches would differ significantly from the survey catches." Also, Table 7 is specifically titled: "Species breakdown for 3LN redfish from Ni (1982)".

The implicit interpretations of these are that a) Table 7 is from Ni (1982) and b) the table information is based on anal fin ray counts alone. Both of these are incorrect. The table is actually extracted from Table 5 of Morin, R. B., R. Methot, J.-M. Sévigny, D. J. Power, R. M. Branton, and T. M. McIntyre. 2004. Review of the structure, the abundance and distribution of *Sebastes mentella* and *S. fasciatus* in Atlantic Canada in a species-at-risk context. CSAS Res. Doc. 2004/058:96. The assessment document does not list this paper in its list of references implying it was not reviewed. Morin et al. derived their estimates using the same database as Ni (1982) but based on 3 meristic characteristics; anal fin ray counts, dorsal fin ray counts and vertebrae counts. Specifically "Based on a published literature review tabled in Ni (1982), studies of meristic characters by various researchers suggest the following: *S. mentella* has 30 vertebrae (V), 8-9 anal fin rays (AFR), 15 dorsal fin rays (DFR) while *S. fasciatus* has 29 V, 7-8 AFR, 14 DFR. Individual fish from the meristic database were assigned to one or the other species if two of the three characters exhibited the typical count. Ambiguous specimens were not used (eg. a fish with 30 V, 8 AFR and 14 DFR). The data were then partitioned into two groups, dependent on whether the data were collected in the first half or the second half of the year. Proportions of each species were then calculated from the database by "stock" area, depth zone and separately for each half year." Depths in fathoms was used so as to correspond to the stratification scheme used in the Canadian surveys in 3LN.

A more appropriate approach would have been to utilize the information in Figure 4 of Ni (1982) combined with Table 2 of Kenchington, T., and I.-H. Ni. 1983. Comment on meristic variation in beaked redfishes, *Sebastes mentella* and *S. fasciatus*, in the Northwest Atlantic. Reply. Canadian Journal of Fisheries and Aquatic Sciences 40:1532-1536 for comparison with the 2015 sampling information.

There are two other important aspects of the work of Ni (1982) that were not considered by the assessment team. Ni (1982) specifically noted there was inter-annual variability in vertebrae counts with depth "On the Grand Bank, vertebral frequencies fluctuated yearly in <500-m waters of Div. 3L, in medium depth zones of Div. 3N (200 - 299 m and 400 -499 m)...". It is possible that similar inter-annual variability may occur with the anal fin ray counts but there was no consideration of this in the assessment document nor in the use of a single year of information (2015) as rationale for using the modified tree. It is unknown if the 2015 information regarding anal fin ray counts falls within the overall multi-year range of counts in the Ni (1982) database or not, and this was not investigated.

The second feature, again not considered by the assessment team, was that differences were found by Ni (1982) between 3L and 3N as indicated in his Figure 4 for anal fin ray counts, and his Figure 7 for all 3 characteristics combined. Also, based on additional information in Table 5 of Morin et al. (2004), for depths between 201-300 fathoms, the ratio is quite different between autumn and spring. It is unknown if this same situation exists based on anal fin ray counts alone or not, or whether this is also subject to inter-annual variability, but it does nonetheless, suggest there may be a seasonal component to the species mixing. This too was not considered by the assessment team.

The range of 201-300 fathoms in Morin et al. Table 5 encompasses almost 200 m (368m-548m) and seems to be a range where a major change-over occurred between species. It would be important to look more closely and the situation here.

In conclusion, it is unknown if there are actually significant changes between the anal fin ray count data in the Ni database and the 2015 results or whether the current anal fin ray count data (2015) are an adequate representation of the present situation regarding the species proportions. In-depth analyses of the Ni database as well as the 2015 database would be required to clarify these uncertainties and place the assessment determinations on firmer ground. Specifically I would argue that as a minimum, the following are needed:

1. Re-examine the Ni database following the approach of Morin et al. (2004) (i.e., using all 3 meristic characteristics) but separating the data by depth in metres rather than fathoms. This separation is for 2 reasons; first, Ni presented his information based on separation by metres rather than fathoms and I gather the 2015 data were analysed by metre depth ranges. Second, the range of 201-300 fathoms in Morin et al. Table 5 encompasses almost 200 m (368m-548m) and seems to be a range where a major change-over occurred between species. It would be important to look more closely and the situation here.
2. Examine the anal fin ray counts in the Ni database using the same approach as was used for the analysis of the 2015 data (assuming the approach was appropriate) then compare the results with those from 1 above to see if anal fin ray counts alone suggest the same species mix at depth.
3. If the results from 2 above are different than those from 1 above, there would be a need to resolve the differences and reach a sound conclusion as to which approach is more appropriate for species classification. If using the 3 meristic characters is deemed better, then it is a 'back to the drawing board' situation and the entire premise behind the modified tree will require revisiting (as would future sampling).
4. If the results from 2 above are similar such that it is concluded that anal fin ray counts alone are adequate, the next step required would be to examine for possible inter-annual variability in the Ni data and then determine if the 2015 samples fall within or outside that variability. If outside, then the current conclusions are better substantiated but if inside then it cannot be ruled out that there is a year effect involved and the current conclusions, based on data from a single year (2015), would be brought into question.

All of the above should include consideration of possible seasonal and divisional differences. Additionally, the assessment team should be sure that any future sampling is sufficient to account for both seasonal and divisional differences. There may also be differences between northern and southern 3L as per Atkinson, D. B. 1989. Seasonal Distribution of Sharp-beaked Redfish (*Sebastes* spp.) in Northeastern Grand Bank. *J. Northw. Atl. Fish. Sci.* 41:141–150.

I do emphasize that I am not specifically challenging the conclusions based on the 2015 data or the decision to use the modified tree. I do however, believe that by following a more carefully thought out set of protocols when doing the analyses and making the comparisons, the decisions could have been on a much more solid footing thus helping to avoid any nasty surprises down the road.

Lastly, CR 24.5 explicitly requires the CAB "ensure that un-published key information necessary to enable a stakeholder who is not party to this information to be able to properly review the logic used by the team in their conclusion about a particular PI score is made available electronically, in printed form or otherwise for viewing by stakeholders." This has not been done. As such, it is not possible for stakeholders to compare the 2015 sampling results with those of Ni (1982) or Morin et al. (2004). Reviewer 1 raised the issue and the assessment team responded that "The GEAC document is a summary of the results of species composition analysis provided by DFO, the paper/document has not been published yet but is not confidential." Since it is NOT confidential, it is my contention that the public review process should be halted until this documentation is made available. This is especially important since there is no indication that there has been any peer review of the GEAC work/analyses.

Assessment team's response

Bruce Atkinson
31 Markland St. John's
Newfoundland, A1E4A8
Canada

Re: Your Submission regarding the MSC full assessment of the Canada 3LN redfish fishery

Dear Bruce,

The assessment team appointed to conduct the MSC full assessment of the Canada 3LN redfish fishery has reviewed your submission and discussed the concerns you have raised. We do take your concerns seriously and would like to make the following responses.

I confirm that you have been added to the stakeholder data, so you will receive all the stakeholder notifications at each stage of the assessment process.

*The condition (Table A1.3: Condition 1) states: "The client must provide evidence that sufficient data continue to be collected to detect any increase in risk level to deep-water redfish." This assumes that the catches of *S. mentella* will remain <15% as required in CR 27.4.9.1 (c). There is no consideration of the possibility or consequences of the *S. mentella* catch rising to >15% and the implications regarding the application of the revised assessment tree with *S. mentella* as an IPI species. The Condition should include ongoing consideration of the possible proportion of *S. mentella* in the commercial catches."*

Although not specified, the condition does not assume that the catches of *S. mentella* will remain below or at 15%. The condition aims at ensuring that a monitoring is in place and data continue to be collected to obtain biomass trends of the 2 species from the DFO annual trawl survey and catch data of the 2 species by the fishing vessels part of the client group. Subject to a positive certification decision, annual surveillance audits will review the results the DFO annual trawl survey and the distribution of the 2 species in commercial catches. Any increase in the proportion of the *S. mentella* catch exceeding 15% will lead to a revision of the status of *S. mentella* as an IPI stock.

The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at B_{msy} or above, however the target reference point for this fishery is B_{pa} , with no indication of how this is consistent with a B_{msy} level.

The team worked on the assumption that the NAFO target reference and long term objective of the 3LN Conservation Plan is to maintain the biomass in the "safe zone", at or near B_{msy} , as noted in Annex 6 of the 3LN Redfish conservation plan and harvest control rule – Supplementary Guidance (NAFO 2016). Item 4. (p. 16) specifies that:

4. Supplementary Guidance to the 3LN Redfish Harvest Control Rule (Annex 1):
 - a) When biomass is below B_{lim} :
 - i. No directed fishing
 - ii. By-catch should be restricted to unavoidable by-catch in fisheries directing for other species
 - b) When biomass is between B_{lim} and 80% of B_{msy}

- i. TAC's should be set at a level(s) to allow for growth to above 80% of B_{msy} or to avoid or mitigate further decline in biomass consistent with explicit rebuilding objectives
- c) When biomass is above 80% of B_{msy}
 - i. TAC's should be set at a level(s) to maintain biomass above 80% of B_{msy} or to avoid or mitigate decline below 80% of B_{msy}
- d) If fishing mortality is above F_{msy}
 - i. Fishing mortality should be reduced to a level below F_{msy} .

This summary is consistent with the definition of the NAFO over all Precautionary Approach Framework outlined in NAFO (2004). The team did not find any reference to Bpa in recent NAFO 3LN redfish management documents. Nor did the recent assessments (2014, 2016) or the 2014 MSE (NAFO 2014) make reference or attempt to derive Bpa as a basis for framing harvest advice.

The team notes that ICES defines Bpa as a precautionary reference point for spawning biomass but the current 3LN redfish assessments uses total biomass. The team does note in the review document (Section 4.3.1) that among the uncertainties not examined in the assessment was the impact of using SSB instead of total biomass. Translating the model to use SSB as opposed to total biomass could improve resolution on how much current harvest is focussing on immature fish, however, the conversion from total biomass to spawning biomass would introduce additional uncertainty.

The team leaves the scoring for 1.1.2 as SG 80.

#2 P. 12 Comment: Lack of adequate consultation (p.12)

I wish to comment on the adequacy of the consultation process used to gather information about this fishery (for example, related to the RBF process, selection of stakeholders consulted, etc.)

Section 5.4.1 of the Assessment Document states: "The assessment team could not meet face-to-face DFO, GEAC and DFA as at the time of the site visit, all flights to Newfoundland were cancelled due to bad weather conditions." In Table 16 a list of those who participated in the conference calls is provided. The discussions with DFO only included one individual, Brooks Pilgram, who is with fisheries management. All other discussions were with the NAFO Secretariat, NL Provincial Government or the client. At no time was there any consultation with DFO science personnel. This is regarded as an important shortcoming as these are a) the people with expertise in redfish generally - species separation (*S. mentella* and *S. fasciatus*) and Canadian 3LN redfish survey results and interpretation, as well as being regular participants in the NAFO Scientific Council assessments of 3LN redfish (NL Region personnel) who could have provided valuable insights regarding various P1 issues including the decision to use the modified assessment tree with the UoC being *S. fasciatus* with *S. mentella* designated an IPI species with catches <15% (see further comment on this below); and b) people with expertise and experience with multi-species/ecological/habitat issues including work on identification of VME's in the area of the fishery, both inside and outside the Canadian 200-mile EEZ who could have provided important information related to P2 issues. I do not consider it adequate that discussions were only held with the NAFO Secretariat staff (or the client) regarding these issues.

In Table 16 of the previous version of the document, the team inadvertently omitted the names of additional DFO staff, including those from the Science Branch who were also present in the conference call of 23/07/2016. These included Dave Coffin (Fisheries Management), Dawn Mercer (Ecosystem Management), Brian Healey (Science), Don Power (Science), and Nadine Wells (Science). Table 16 has been corrected and the team apologizes for the oversight. The team also notes that there was subsequent email exchanges with Science staff regarding how the Ni (1982) data were used to derive the biomass indices in the original attempt in DFO 2011 and subsequently updated by DFO with more recent redfish survey indices, without changing the original methodology, during preparation of this report. During preparation of the report, there were also subsequent email exchanges with Alexandra

Valentin (Valentin et al. 2014 and others) on the status of recent genetics work on redfish as it related to Div. 3LN redfish.

#3. P. 12 Comment.

Lack of availability of consultation summaries

There are no details regarding the nature or specifics discussed during the consultations during the site visit provided in the document as per CR 27.15.3 requirements.

Table 16 in section 5.4.2 provides information on the nature and specific topics discussed with stakeholders met during the site visit.

#4 P 12. Species Biology/Species Separation (see Attachment #1:P 16)

ATTACHMENT 1:

Section 4.3.1.1; Species Composition. It is stated: "The previously assumed species composition of Div. 3LN redfish is based on Ni (1982). Depth distribution of *S. mentella* by this method is presented in (Table 7). It is clear that *S. mentella* was expected to be the dominant species beyond 365 m of depth. However results collected in the fall of 2015 indicate that depths less than 600 meters are, in fact, dominated by *S. fasciatus*. Furthermore, the sampling suggests that *S. mentella* actually comprises significantly less of the biomass than anticipated, as indicated by a very low proportion of samples with AFC counts greater than 8 across all depths and an absence of samples available beyond 650 m of depth. It is clear that *S. fasciatus* comprises a much larger proportion of the biomass than would be expected based on Ni (1982). Furthermore, there is no reason to assume commercial catches would differ significantly from the survey catches." Also, Table 7 is specifically titled: "Species breakdown for 3LN redfish from Ni (1982)".

The implicit interpretations of these are that a) Table 7 is from Ni (1982) and b) the table information is based on anal fin ray counts alone. Both of these are incorrect. The table is actually extracted from Table 5 of Morin, R. B., R. Methot, J.-M. Sévigny, D. J. Power, R. M. Branton, and T. M. McIntyre. 2004. Review of the structure, the abundance and distribution of *Sebastes mentella* and *S. fasciatus* in Atlantic Canada in a species-at-risk context. CSAS Res. Doc. 2004/058:96. The assessment document does not list this paper in its list of references implying it was not reviewed. Morin et al. derived their estimates using the same database as Ni (1982) but based on 3 meristic characteristics; anal fin ray counts, dorsal fin ray counts and vertebrae counts. Specifically "Based on a published literature review tabled in Ni (1982), studies of meristic characters by various researchers suggest the following: *S. mentella* has 30 vertebrae (V), 8-9 anal fin rays (AFR), 15 dorsal fin rays (DFR) while *S. fasciatus* has 29 V, 7-8 AFR, 14 DFR. Individual fish from the meristic database were assigned to one or the other species if two of the three characters exhibited the typical count. Ambiguous specimens were not used (eg. a fish with 30 V, 8 AFR and 14 DFR). The data were then partitioned into two groups, dependent on whether the data were collected in the first half or the second half of the year. Proportions of each species were then calculated from the database by "stock" area, depth zone and separately for each half year." Depths in fathoms was used so as to correspond to the stratification scheme used in the Canadian surveys in 3LN.

The document has been corrected to reflect the above comments.

A more appropriate approach would have been to utilize the information in Figure 4 of Ni (1982) combined with Table 2 of Kenchington, T., and I.-H. Ni. 1983. Comment on meristic variation in beaked redfishes, *Sebastes mentella* and *S. fasciatus*, in the Northwest Atlantic. Reply. Canadian Journal of Fisheries and Aquatic Sciences 40:1532–1536 for comparison with the 2015 sampling information.

The team agrees with the reviewer that additional research could have been or could be conducted to improve basis for estimating the relative abundance of the two species, and, even more importantly, the actual abundance or abundance trends of both species of redfish. Nevertheless however, the GEAC document was the only analysis available to the team and as such indicates a radical radical change in species ratios and low relative abundance of *S. mentella*.

There are two other important aspects of the work of Ni (1982) that were not considered by the assessment team. Ni (1982) specifically noted there was inter-annual variability in vertebrae counts with depth "On the Grand Bank, vertebral frequencies fluctuated yearly in <500-m waters of Div. 3L, in medium depth zones of Div. 3N (200 - 299 rn and 400 -499 rn)..." It is possible that similar inter-annual variability may occur with the anal fin ray counts but there was no consideration of this in the assessment document nor in the use of a single year of information (2015) as rationale for using the modified tree. It is unknown if the 2015 information regarding anal fin ray counts falls within the overall mulit-year range of counts in the Ni (1982) database or not, and this was not investigated.

The second feature, again not considered by the assessment team, was that differences were found by Ni (1982) between 3L and 3N as indicated in his Figure 4 for anal fin ray counts, and his Figure 7 for all 3 characteristics combined. Also, based on additional information in Table 5 of Morin et al. (2004), for depths between 201-300 fathoms, the ratio is quite different between autumn and spring. It is unknown if this same situation exists based on anal fin ray counts alone or not, or whether this is also subject to inter-annual variability, but it does nonetheless, suggest there may be a seasonal component to the species mixing. This too was not considered by the assessment team.

The team agrees, a comment has been added (end of section 4.3.1.1) to reflect the reviewer's concerns. The team notes that the important issue is that the surveys now routinely incorporated the collection of anal fin ray counts so that future work can monitor the trends of each species. New data can be used to exmaine variability in AFN counts, seasonally and annually but even more important, allow researchers do drop the implausible assumption that species ratios remain constant at depth over >25 years.

The range of 201-300 fathoms in Morin et al. Table 5 encompasses almost 200 m (368m-548m) and seems to be a range where a major change-over occurred between species. It would be important to look more closely and the situation here.

As noted above, the team agrees a more conprehensive anlalysis of the survey sampling data should be part of an overall treatment which begins to address the ratios, trends and abundance of each species rather treating the two speices as one as has been approach for many years. However, outlining the details of how meristic data analyses (hopefully groundtruthed with genetics data) should be conducted is outside the scope of this document.

In conclusion, it is unknown if there are actually significant changes between the anal fin ray count data in the Ni database and the 2015 results or whether the current anal fin ray count data (2015) are an adequate representation of the present situation regarding the species proportions. In-depth analyses of the Ni database as well as the 2015 database would be required to clarify these uncertainties and place the assessment determinations on firmer ground. Specifically I would argue that as a minimum, the following are needed:

1. Re-examine the Ni database following the approach of Morin et al. (2004) (i.e., using all 3 meristic characteristics) but separating the data by depth in metres rather than fathoms. This separation is for 2 reasons; first, Ni presented his information based on separation by metres

rather than fathoms and I gather the 2015 data were analysed by metre depth ranges. Second, the range of 201-300 fathoms in Morin et al. Table 5 encompasses almost 200 m (368m-548m) and seems to be a range where a major change-over occurred between species. It would be important to look more closely and the situation here.

2. Examine the anal fin ray counts in the Ni database using the same approach as was used for the analysis of the 2015 data (assuming the approach was appropriate) then compare the results with those from 1 above to see if anal fin ray counts alone suggest the same species mix at depth.
3. If the results from 2 above are different than those from 1 above, there would be a need to resolve the differences and reach a sound conclusion as to which approach is more appropriate for species classification. If using the 3 meristic characters is deemed better, then it is a 'back to the drawing board' situation and the entire premise behind the modified tree will require revisiting (as would future sampling).
4. If the results from 2 above are similar such that it is concluded that anal fin ray counts alone are adequate, the next step required would be to examine for possible inter-annual variability in the Ni data and then determine if the 2015 samples fall within or outside that variability. If outside, then the current conclusions are better substantiated but if inside then it cannot be ruled out that there is a year effect involved and the current conclusions, based on data from a single year (2015), would be brought into question.

All of the above should include consideration of possible seasonal and divisional differences. Additionally, the assessment team should be sure that any future sampling is sufficient to account for both seasonal and divisional differences. There may also be differences between northern and southern 3L as per Atkinson, D. B. 1989. Seasonal Distribution of Sharp-beaked Redfish (*Sebastes* spp.) in Northeastern Grand Bank. J. Northw. Atl. Fish. Sci. 41:141–150.

I do emphasize that I am not specifically challenging the conclusions based on the 2015 data or the decision to use the modified tree. I do however, believe that by following a more carefully thought out set of protocols when doing the analyses and making the comparisons, the decisions could have been on a much more solid footing thus helping to avoid any nasty surprises down the road.

The team agrees that a more comprehensive analysis of the recent AFN data would be appropriate that more years of sampling (2016-2017) and from both seasons should now be available to explore the important issues outlined above. Nevertheless, for this report the team was acting on the analyses that were made available, and notwithstanding the uncertainties articulated by the reviewer, indicate the low relative abundance of *Sebastes mentella* that supports the IPI basis.

More comprehensive treatments with additional data may well contradict conclusions of recent work, the important issue is that the source data are now being collected, with which these issues can be examined now and in the future rather than assuming that data collected from 1970-1980 continue to reflect the present.

Lastly, CR 24.5 explicitly requires the CAB "ensure that un-published key information necessary to enable a stakeholder who is not party to this information to be able to properly review the logic used by the team in their conclusion about a particular PI score is made available electronically, in printed form or otherwise for viewing by stakeholders." This has not been done. As such, it is not possible for stakeholders to compare the 2015 sampling results with those of Ni (1982) or Morin et al. (2004). Reviewer 1 raised the issue and the assessment team responded that "The GEAC document is a summary of the results of species composition analysis provided by DFO, the paper/document has not been published yet but is not confidential." Since it is NOT confidential, it is my contention that the public review process should be halted until this documentation is made available. This is especially

important since there is no indication that there has been any peer review of the GEAC work/analyses.

The document has been edited to indicate where the GEAC document can be obtained (see References). The team agrees with the reviewer that further research on the protocol for estimating species proportions in survey and/or commercial catches is needed. In fact, future work might be better spent on adding groundtruthing work with genetics sampling with a penetrating sampling design. Genetics work has decreased in costs dramatically such that both US and DFO scientists in Alaska and British Columbia routinely use genetics sampling to distinguish between two cryptic red *Sebastes* species (rougeye and blackspotted rockfish) in the surveys. Nevertheless, the team suggests that it is reasonable for a MSC review to consider non-peer reviewed material. The important issue is that this MSC review and its conditions and recommendations has successfully focused on drawing attention to the need to assess and manage each species separately rather than as a complex and, therefore, the importance of improving monitoring in the future as supported by the reviewer.

List of references

DFO. 2011. Recovery potential assessment of redfish (*Sebastes mentella* and *S. fasciatus*) in the Northwest Atlantic. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2011/044

NAFO. 2004. Annual Meeting – September 2004. NAFO Precautionary approach framework. NAFO/FC Doc. 04/18. Ser. No. N509.

NAFO 2014. Part B. Report of the fisheries commission and scientific council joint working group on risk-based management strategies, 5-7 February 2014. FC-SC RBMS 5-7 Feb 2014.

NAFO. 2014. Part D: Scientific council Ad hoc working group on management strategies for redfish in Div. 3LN, 13 May 2014. NAFO SC 13 May 2014. 27 p.

NAFO, 2016. NAFO 2016. Report of the NAFO Joint Fisheries Commission-Scientific Council Working Group on Risk-Based Management Strategies. 4-6 April 2016. Torshavn, Faroe Islands. NAFO Dartmouth, Nova Scotia, Canada. 2016. Serial No. N6532.

Valentin, A. E., Penin, X., Chanut, J., Power, D., and Sevinya, J.M. 2014. Combining microsatellites and geometric morphometrics for the study of redfish (*Sebastes* spp.) population structure in the Northwest Atlantic. Fish. Res. 154: 102-119.

Thank you, once again, for having taken the time to communicate with the assessment team on your concerns.

Yours Sincerely,



Géraldine Criquet
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SAI Global
EMEA Region

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MSC Review and report on Compliance with the scheme requirements and Assessment Team's responses

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Date: 30/03/2017

SUBJECT: MSC Review and Report on Compliance with the scheme requirements

Dear Geraldine Criquet

Please find below the results of our partial review of compliance with scheme requirements.

CAB	SAI Global (SAI)
Lead Auditor	Geraldine Criquet
Fishery Name	Canada 3LN redfish
Document Reviewed	Public Comment Draft Report

Ref	Type	Page	Requirement	Reference	Details	PI
26939	Guidance	93	CR-27.12.1.3 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.3 The opportunity of substitution of certified with non-certified fish prior to or at landing fraudulent claims from within and outside their certified fishery.	Page 93 section 6 Could you please confirm that both gear types (mid water and bottom trawling) are within the UoC and that there is no possibility for other non-certified gears to be used by any of the three vessels mentioned.	

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Assessment team's response

It's confirmed that both bottom trawl (UoC 1) and mid-water trawl (UoC 2) are within the fishery under assessment and there is no possibility for other gears not covered by the UoCs to be used by any of the three vessels operating in the fishery under assessment. This statement has been added in section 6 of the report.

26940	Guidance	13, 93	CR-27.12.1.2 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.2 The possibility of vessels fishing outside of the unit of certification.	Page 13 Section 4.1.3 and page 93 Section 6.2 Please be clear if there are other vessels outside of the UoC or client group fishing the same stock. This information is inconsistent between the two sections on p.13 and p.93. On p13 it states that "There are other fisheries targeting redfish in Division 3LN." but on p93 it states " There are no other Canadian trawl vessels engaged in fishing for redfish in NAFO Divisions 3LNO". Should this be the case, is there any risk of catches made by non-Canadian vessels entering the supply chain as certified?
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Assessment team's response

The assessment team apologises for the confusion. Although there are no other Canadian trawl vessels outside the client group engaged in fishing for redfish in NAFO Divisions 3LN, there are non-Canadian trawl vessels targeting redfish in NAFO Div. 3LN. Redfish catches by other nations are presented in Table 4. There is no risk of catches made by non-Canadian vessels entering the supply chain as certified. Although it is possible that non-Canadian vessels might offload frozen-at-sea redfish and cargo ship through a bonded warehouse in a Canadian port, it is strictly done under the terms of cargo and could not be labelled as product of Canada.

Clarification has been provided in both sections 4.1.2 and 6.2.

26941	Guidance	93	CR-27.12.2.1.b v.1.3	27.12.2 If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine: 27.12.2.1 The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point(s) at which chain of custody is needed. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determined that the systems within the fishery are not sufficient to make sure all fish and fish products identified as such by the fishery originate from the certified fishery.	Page 93 section 6.3 Although CoC is required from the point of landing, please confirm if the point of landing is also where change of ownership takes place.	
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[Assessment team's response](#)

Confirmation that the point of landing is where change of ownership takes place has been added in section 6.3.

26947	Major		CR-CB2.2.1.3 v.1.3	High degree of certainty means great than or equal to the 95th percentile.	The rationale for PI 1.1.1 scoring issue (b) states: The assessment does not provide confidence limits around the estimates of B/Blim, but it indicates there is almost a 80% certainty that the biomass of the complex is greater than Bmsy and that the point estimate of the current biomass been above Bmsy for 4-5 years. However, high degree of certainty at the 100 scoring guidepost requires a 95th percentile.	1.1.1
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[Assessment team's response](#)

The rationale has been amended as follow: "While there is no direct quantitative evidence, the team infers that it is highly likely that the point estimate of *S. fasciatus* has been greater than the target reference point in recent years and therefore the stock status satisfies the conditions for a score of SG 80". The score of PI 1.1.1 has been revised from 100 to 90, the overall score of Principle 1 was revised from 95.6 to 93.1.

26948	Guidance				Throughout the report there are a number of ERROR! In place of references.	
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[Assessment team's response](#)

The assessment team acknowledges MSC for this comment. The report has been reviewed, the ERROR! deleted and replaced by the right reference.

26949	Major	80	CR-27.4.13 v.1.2	The CAB shall determine if the assessment of the applicant fishery will result in an overlapping assessment.	It is not clear why the US Acadian redfish and Canadian redfish are not considered overlapping fisheries. MSC defines overlapping fisheries as two or more fisheries which require assessment of some or all, of the same aspects of MSC Principles 1, 2 and/3 within their respective units of certification. In this instance rationale is needed to support the claim that Canada and the US acadian redfish are on distinct and different stocks.	
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This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact the relevant FAM for more information.

If you have any questions regarding this response, please do not hesitate to contact the relevant Fisheries Assessment Manager for this fishery.

Marine Stewardship Council
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[Assessment team's response](#)

The US Acadian redfish, pollock and haddock fishery and the Canada 3LN redfish are not considered as overlapping fisheries, and harmonization is required for none of the 3 Principles. The redfish stock in 3LN is distinct from redfish stock in the Gulf of Maine. The population structure of *S. fasciatus* appears to be characterized by the presence of 3 broad groups corresponding to three geographic areas (Valentin 2006, Valentin et al 2014). The first group comprises the Gulf of St. Lawrence – Laurentian Channel. The second group is distributed from the slope of the Grand Banks (3LNO) to the southern margin of Unit 2 (southern tip of St. Pierre Bank). The third group includes the Gulf of Maine and Nova Scotia Shelf. Overall, this southern group tends to be genetically differentiated from the northern group and from that of the Gulf of St. Lawrence – Laurentian Channel. The 2 fisheries operate in different ecosystems and under a different management system.

Appendix 4. Surveillance Frequency

(REQUIRED FOR THE PCR ONLY)

Table A4: Fishery Surveillance Plan

Appendix 5. Client Agreement

(REQUIRED FOR PCR)

Appendix 5.1 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR.)