



Marine Stewardship Council Assessment Public Certification Report

For the

**Nova Scotia and New Brunswick Lobster Eco-Certification Society
Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence
lobster (*Homarus americanus*) Trap Fisheries**

Assessors: Géraldine Criquet, Jean-Claude Brêthes, R.J. (Bob) Allain

Report Author: Géraldine Criquet, Jean-Claude Brêthes, R.J. (Bob) Allain

Report Author: SAI Global Assurance Service

Association: 3rd Floor Block 3

Quayside Business Park

Mill Street

Dundalk, Co. Louth

Ireland

Tel: +353 42 9320912

Fax: + 353 42 9386864

W: www.saiglobal.com

Client Name: Nova Scotia and New Brunswick Lobster Eco-Certification
Society

Report Code: **MSC 013**

Report Date: 20th May 2015

Table of Contents

Glossary	4
1. MSC Fishery Assessment Report.....	6
2. Executive Summary.....	7
2.1 NB and NS lobster fisheries key strengths and weaknesses	8
2.2 Assessment Results and Conditions	9
2.3 Certification Recommendation	11
2.4 Assessment Process	11
3. Authorship	12
3.1 Assessment team	12
3.2 Peer reviewers.....	13
4. Description of the Fishery	14
4.1 Unit of Certification and scope of certification sought	14
4.1.1 Eligibility for Certification against the MSC Standard.....	15
4.1.3 Scope of Assessment in Relation to Enhanced Fisheries.....	15
4.1.4 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)	15
4.2. Overview of the fishery	16
4.2.1. Biology of the target species.....	16
4.2.2. Fishing area	19
4.2.3. History of lobster fisheries	23
4.2.4. Catches.....	28
4.2.5. Fishing season	37
4.2.6. Fishing method and fleet description	38
4.2.7. Market information	41
4.3. Principle One: Target Species Background	42
4.3.1. Southern Gulf of St Lawrence (UoC 1)	42
4.3.2. Eastern Scotian Shelf (UoC 2).....	71
4.3.3. Southwestern Scotian Shelf and Bay of Fundy (UoCs 3 and 4)	94
4.4. Principle Two: Ecosystem Background	133
4.4.1. Retained species	134
4.4.2. Bycatch species	143
4.4.3. ETP species (for all UoCs)	147
4.4.4. Habitat (for all UoCs).....	159
4.4.5. Ecosystem (for all UoCs)	171
4.5. Principle Three: Management System Background	180
4.5.1 The Legal Basis and Scope of the Management System	180
4.5.2 Consultation Processes	186

4.5.3 Long Term Objectives (For all UoCs)	192
4.5.4 Incentives for Sustainable Fishing (For all Uocs).....	195
4.5.5 Fishery Specific Objectives	197
4.5.7 Monitoring, Control and Surveillance.....	205
4.5.8 Research Plan.....	222
5. Evaluation Procedure.....	240
5.1. Harmonised Fishery Assessment	240
5.2 Previous assessments.....	243
5.3 Assessment Methodologies	243
5.4 Evaluation Processes and Techniques.....	247
5.4.1 Site Visits	247
5.4.2 Consultations.....	247
5.4.3 Evaluation Techniques.....	250
6. Traceability.....	253
6.1 Eligibility Date	253
6.2 Traceability within the Fishery.....	253
6.2.1 Introduction	253
6.2.2 Traceability within the fishery	254
6.3 Eligibility to Enter Further Chains of Custody	256
7. Evaluation Results.....	257
Appendices	268
Appendix 1 Scoring and Rationales	268
Appendix 1.1 Performance Indicator Scores and Rationale	268
Appendix 1.2 Risk Based Framework (RBF) Outputs.....	404
Appendix 1.2.1 Scale Intensity Consequence Analysis (SICA).....	404
Appendix 1.2.2 Productivity-Susceptibility Analysis (PSA).....	423
Appendix 1.3 Conditions and Client Action Plan	433
Appendix 2. Peer Review Reports	445
Appendix 3. Stakeholder submissions	476
Appendix 4. Surveillance Frequency.....	518
Appendix 5. Client Agreement.....	519
Appendix 5.1 Objections Process	520
Appendix 6. Lobster Distribution Description	521

Glossary

AFR	Atlantic Fishery Regulations (1985)
AFS	Aboriginal Fisheries Strategy
ALSM	Atlantic Lobster Sustainability Measures
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)
CL	Carapace Length
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
CW	Carapace Width
DFARD	PEI Department of Fisheries, Aquaculture and Rural Development
DFO	Department of Fisheries and Oceans Canada
DMP	Dockside Monitoring Program
EAM	Ecosystem Approach Management
EEZ	Exclusive Economic Zone
EPR	Egg production-per-recruit
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
FPPS	Fisheries Protection Policy Statement
FRCC	Fisheries Resource Conservation Council
FSRS	Fishermen and Scientists Research Society
GOSLIM	Gulf of St. Lawrence Integrated Management project
IFMP	Integrated Fisheries Management Plan
HCR	Harvest Control Rule
LFA	Lobster Fishing Area
LPA	Lobster Productivity Area
LRMP	Lobster Resource Monitoring Program of Prince Edward Island
LRP	Limit Reference Point
MLS	Minimum Legal Size
MPA	Marine Protected Area

MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield, it is the largest average catch that can be continuously taken from a stock under existing environmental conditions
NB	New Brunswick
NS	Nova Scotia
PA	Precautionary Approach
P1	MSC Principle 1
P2	MSC Principle2
P3	MSC Principe 3
PI	MSC Performance Indicator
RAP	Regional Advisory Process
RBF	MSC's Risk-Based Framework
SAR	Science Advisory Report
SARA	<i>Species At Risk Act</i>
SFF	Sustainable Fisheries Framework
SG	Scoring Guidepost
SGSL	Southern Gulf of St. Lawrence
SPA	Sequential Population Analysis
UoC	Unit of Certification
yoY	young-of-year

1. MSC Fishery Assessment Report

Fishery Unit	This assessment report under the 'Unit of Certifications' (UoCs) covers one target species and one method of capture and the resulting scores are for traps landings by registered licence holders. Fishing for these UoCs is entirely within the Canadian Exclusive Economic Zone (EEZ) and exclusively in Lobster Fishing Areas (LFAs) 23, 25, 26A, and 26B (UoC 1), 27-33 (UoC 2), 34 (UoC 3), and 35-38 (UoC 4).	
Report Issue	2 nd July 2014 15 th October 2014 (revised)	• Client Report
	28 th October 2014	• Peer Review
	22 nd January 2015	• Public Comment Draft Report
	28 th April 2015	• Final Report and Determination
	20 th May 2015	• Public Certification Report
Correspondence to	SAI Global Assurance Service 3rd Floor, Block 3, Quayside Business Park, Mill Street, Dundalk, Co. Louth, Ireland. Website: www.saiglobal.com Programme Administrator: Jean Ragg, Jean.Ragg@saiglobal.com	
Client Name & Contact Details	Client Group: Nova Scotia and New Brunswick Eco-Certification Society Contact details: 1819 Granville Street, Unit 302, Halifax NS B3H 1A1, Canada Peter Norsworthy, Client Representative Pisces Consulting Limited, 745 Sackville Drive, PO Box 612, Lower Sackville, NS B4C 3J1. Tel: 1-902-482-0984 Email: pisces@ns.sympatico.ca	

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 Public Certification Report is written for the stakeholders after the site visit, scoring, Client review, peer review, the stakeholder consultation period on the PCDR, and the objection procedure, 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 set 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 final decision from the Certification Committee on the fishery certification.
 - The Peer Reviewers comments and the assessment team's responses in Appendix 2.
 - The stakeholder's 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.

- The surveillance frequency in Appendix 4.
- The Client agreement in Appendix 5.

2. Executive Summary

This report sets out the details of the MSC assessment for the Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster (*Homarus americanus*) Trap 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 2014. As a requirement of the assessment process (CR 27.9.1), the site visit announcement was advertised in the following local newspapers, *Brunswick News* and *The Chronicle Herald*, as it was felt there were the most appropriate publications 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 Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster trap fishery proposed for certification is defined according to the UoCs:

UoC 1

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Southern Gulf of St Lawrence, LFAs 23, 25, 26A and 26B
Stock	Southern Gulf of St. Lawrence
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Gulf Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 2

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Scotian Shelf, LFAs 27-33
Stock	Eastern Nova Scotia
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 3

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Scotian Shelf, LFAs 34
Stock	Southwestern Nova Scotia
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 4

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Bay of Fundy, LFAs 35-38

Stock	Bay of Fundy
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

This fishery has not previously been assessed against the MSC Principles and Criteria for Sustainable Fishing under any other previous certificate. The current assessment of UoCs 2, 3 and 4 did not require taking into account other assessments led by a CAB to ensure consistency of assessment outcomes as there is no other lobster fishery undergoing certification or any fishery assessments that overlap at present (See section 5.1). However, the current assessment of UoC 1 did require taking into account the assessment of the Prince Edward Island (PEI) Lobster Trap fishery, carried out by SAI Global, to ensure consistency of assessment outcomes as there is overlapping between UoC 1 and the PEI Lobster Trap Fishery (See section 5.1).

The assessment covers Lobster Fishing Areas (LFA) 23, 25, 26A and 26B (UoC 1); LFAs 27-33 (UoC2); LFA 34 (UoC 3); and LFAs 35-38 (UoC 4) and its New Brunswick (NB) and Nova Scotia (NS) lobster licence holders. A full and up to date active list of fleet licences will be made available by the client group and 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:

http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/bay-of-fundy-scotian-shelf-and-southern-gulf-of-st-lawrence-lobster-trap/assessment-downloads-1/20140318_Client_Sharing_Letter_LOB428.pdf

2.1 NB and NS lobster fisheries key strengths and weaknesses

UoC 1

Strengths	Weaknesses
<ul style="list-style-type: none"> Lobster is in high abundance in the SGSL Lobster Resource Monitoring Program Robust harvest strategy The fishery is highly unlikely to disrupt key elements underlying ecosystem structure and function Robust governance and policy 	<ul style="list-style-type: none"> Well-defined harvest control rules are not in place Absence of bycatch data collection Absence of research plan Absence of a partial strategy to ensure the Southern Gulf of St Lawrence lobster fishery does not hinder the recovery and rebuilding of the Canadian mackerel stock.

UoCs 2, 3 and 4

Strengths	Weaknesses
<ul style="list-style-type: none"> Fishermen and Scientist Research Society Lobster Projects Robust harvest strategy Fisheries are highly unlikely to disrupt key elements underlying ecosystem structure and function 	<ul style="list-style-type: none"> Well-defined harvest control rules are not in place Accurate and sufficient data on bycatches are not collected Absence of research plan Absence of a partial strategy to ensure the

• Robust governance and policy	Eastern Scotian Shelf, Southwestern Nova Scotia and Bay of Fundy lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock.
--------------------------------	--

2.2 Assessment Results and Conditions

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.

The UoC 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).

UoC 1

Principle	Score	PASS/FAIL
Principle 1 – Target Species	81.3	PASS*
Principle 2 – Ecosystem	85.3	PASS*
Principle 3 – Management System	90.8	PASS*

*Although the assessment team found the overall Principle and Unit of Certification in overall compliance with MSC Standard, it also found the performance of five performance indicators (PI 1.2.2, PI 2.1.1, PI 2.1.2, PI 2.2.3, and PI 3.2.4) to be below the established compliance mark (Score of 80). Full explanation of these conditions is provided in Appendix 1.3.

Conditions

Five PIs which contribute to the overall assessment score were assessed as scoring less than the unconditional pass mark, and therefore four 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/N/A)
1	The client must provide evidence of implementation of well-defined harvest control rules that reduce exploitation rates as the limit reference point is approached.	1.2.2	NA
2	The client must provide evidence that a partial strategy of demonstrably effective management measures is in place such that the Southern Gulf of St Lawrence lobster fishery	2.1.1	NA

	does not hinder the recovery and rebuilding of the Canadian mackerel stock.		
3	The client must provide evidence that a partial strategy is in place to ensure the Southern Gulf of St Lawrence lobster fishery does not hinder the recovery and rebuilding of the Canadian mackerel stock. Also, the client must provide some evidence that the partial strategy is being implemented successfully.	2.1.2	NA
4	Qualitative information and some quantitative information are available on the amount of main bycatch species. The client must provide evidence that information on bycatch is adequate to support a partial strategy to manage main bycatch species, and that accurate and sufficient data on the amount of main bycatch species affected by the fisheries are collected to detect any increase in risk to main bycatch species.	2.2.3	NA
5	The client must provide evidence that a written research plan for the fishery 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.	3.2.4	NA

UoCs 2, 3 and 4

Principle	Score	PASS/FAIL
Principle 1 – Target Species	80.3	PASS*
Principle 2 – Ecosystem	83.7	PASS*
Principle 3 – Management System	89.3	PASS*

*Although the assessment team found the overall Principle and Unit of Certification in overall compliance with MSC Standard, it also found the performance of five performance indicators (PI 1.2.2, PI 2.1.1, PI 2.1.2, PI 2.2.3, and PI 3.2.4) to be below the established compliance mark (Score of 80). Full explanation of these conditions is provided in Appendix 1.3.

Conditions

Five PIs which contribute to the overall assessment score were assessed as scoring less than the unconditional pass mark, and therefore four 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/N/A)
1	The client must provide evidence of implementation of well-defined harvest control rules that reduce exploitation rates as the limit reference point is approached.	1.2.2	NA
2	The client must provide evidence that a partial strategy of demonstrably effective management measures is in place such that the East Scotian shelf, Southwestern Scotian Shelf and Bay of Fundy lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock.	2.1.1	Na
3	The client must provide evidence that a partial strategy is in place to ensure the East Scotian shelf, Southwestern Scotian Shelf and Bay of Fundy lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock. Also, the client must provide some evidence that the partial strategy is being implemented successfully.	2.1.2	NA
4	The client must provide evidence that accurate and sufficient data on the amount of bycatch species affected by the fishery are collected to detect any increase in risk to bycatch species.	2.2.3	NA
5	The client must provide evidence that a written research plan for the fishery 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.	3.2.4	NA

2.3 Certification Recommendation

On completion of the assessment and scoring process, the assessment team has recommended that the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fishery is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing.

2.4 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 – 4th March 2014
 - Stakeholder Notification: Assessment team nominated – 4th March 2014
 - Stakeholder Notification: Assessment team confirmation - 18th March 2014
- **Stage 2: Building the Assessment Tree**
- Stakeholder Notification: Draft assessment tree released for comment – 18th March 2014
- **Stage 3: Information gathering, stakeholder meetings and scoring**
 - Stakeholder Notification: Site Visit scheduled – 18th March 2014

- **Stage 4: Client and peer review**
 - Stakeholder Notification: Proposed Peer Reviewers – 26th August 2014
 - Stakeholder Notification: Peer Reviewers confirmed – 9th September 2014
- **Stage 5: Public review of the draft assessment report**
 - Stakeholder Notification: Revised timeline announcement – 9th September 2014
 - Stakeholder Notification: Revised timeline announcement – 16th October 2014
 - Stakeholder Notification: Revised timeline announcement – 13th January 2014
 - Stakeholder Notification: Public Comment Draft Report released – 22nd January 2015
- **Stage 6: Final Report and Determination**
 - Stakeholder Notification: Final Report and Determination released – 28th April 2015

3. Authorship

3.1 Assessment team

Dr. 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.

Dr. Jean-Claude Brêthes (Assessor, Responsibilities on Principle 1)

Jean-Claude is a fisheries biology professional at the Institut des Sciences de la Mer at the Université du Québec à Rimouski. Previously he has held positions at Board, Chair and Director level for University undergraduate and post graduate fishery science/marine/oceanography courses, scientific advisory councils and committees for various government organizations such as the Canadian Atlantic Fisheries Advisory Council. His key experiences have been focused upon the dynamics and ecology of exploited species. In particular, Jean-Claude has conducted various projects on the ecology of snow crab, lobster and cod in locations in Atlantic Canada. He has published and presented several scientific papers in lobster fisheries in key journals and science fora and has also taken part in several MSC and related studies including lobster fisheries in this and other regions.

R.J. (Bob) Allain (Assessor, Responsibilities on Principle 3 and Traceability expert)

Bob Allain is the President of OceanIQ Management Services Inc. for the last 5 years and has a previous professional background in the management of crustacean and other fisheries through his previous employer, Fisheries and Oceans Canada. From 2001-2008 he held the position of Regional Director,

Fisheries and Aquaculture Management, Gulf Region in Moncton, NB where he was responsible for the integrated management of the region's commercial, aboriginal and recreational fisheries including allocation, licensing and enforcement. In this time, Conservation Harvest Plans and, later, Integrated Fisheries Management Plans for reporting, surveillance and resource conservation and management of lobster fishing were developed. During his career, he has successfully led several Canadian delegations at international technical meetings (NAFO) on monitoring, surveillance and control; he managed the operations of the Atlantic Fisheries Licence Appeal Board, developed the framework for a successful Atlantic Fisheries workshop in regard to aquaculture, fish habitat management and fisheries development issues and the administration and coordinated operations of the Department's fisheries management programs and services in respect of conservation and protection, fishermen's vessel insurance services, industry/client relations, licensing, resource allocation, personnel, financial and systems management, and federal-provincial agreements.

3.2 Peer reviewers

Dr. Jerry Ennis

Following undergraduate and graduate degrees at Memorial University of Newfoundland in the 1960s, Dr. Ennis completed a Ph.D. in marine biology at University of Liverpool in the early 1970s. He retired in 2005 following a 37-year research career with the Science Branch of the Department of Fisheries and Oceans. His extensively published work has focused primarily on lobster fishery and population biology and on various aspects of larval, juvenile and adult lobster behavior and ecology in Newfoundland waters. Throughout his career, Dr. Ennis was heavily involved in the review and formulation of scientific advice for management of shellfish in Atlantic Canada as well as the advisory/consultative part of managing the Newfoundland lobster fishery.

Eric Dunne

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.

4. Description of the Fishery

4.1 Unit 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 Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster trap fishery proposed for certification is defined according to the UoCs:

UoC 1

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Southern Gulf of St Lawrence, LFAs 23, 25, 26Aand 26B
Stock	Southern Gulf of St. Lawrence
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Gulf Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 2

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Scotian Shelf, LFAs 27-33
Stock	Eastern Nova Scotia
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 3

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Scotian Shelf, LFAs 34
Stock	Southwestern Nova Scotia
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

UoC 4

Species	<i>Homarus americanus</i> , American lobster or Atlantic lobster
Geographical Area	Bay of Fundy, LFAs 35-38
Stock	Bay of Fundy
Method of capture	Baited trap
Management system	Department of Fisheries and Oceans (DFO) Maritimes Region
Client Group	Nova Scotia and New Brunswick Eco-Certification Society

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;
- There are no catches of non-target stocks that are inseparable or practicably inseparable from the target stock; and

4.1.2 Eligible fishers

There are other lobster fisheries in the SGSL adjacent to LFAs 23, 25, 26A and 26B. There are fishers from Prince Edward Island targeting lobster in LFA 25 and 26A using the same gear (trap is the only fishing gear allowed for harvesting lobster in Atlantic Canada) and operating under the same management regime. They may become eligible to join the Client Group under a certificate sharing arrangement.

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 target species

Taxonomy and geographic range

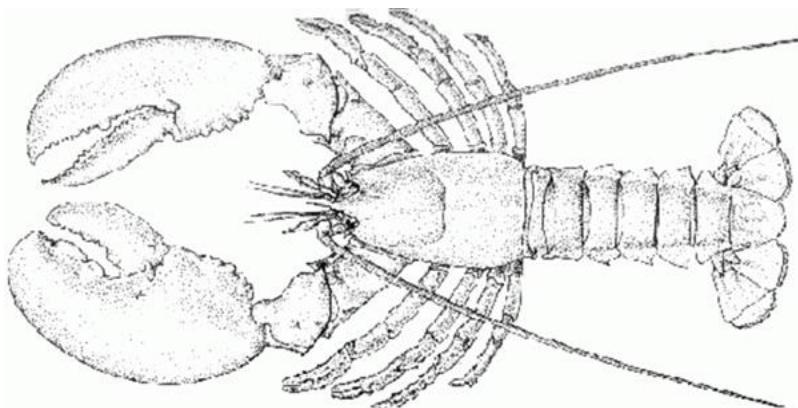


Figure 1. *Homarus americanus*. Source: FAO species fact sheet¹.

The American lobster, *Homarus americanus* (H. Milne Edwards, 1837), is a crustacean belonging to the family Nephropidae.

The American lobster is distributed from Cape Hatteras in North Carolina to Newfoundland to the Strait of Belle Isle that separates Labrador and Newfoundland. The largest populations are found in the Gulf of Maine, southwest Nova Scotia and in the southern Gulf of St. Lawrence².

Migration and stock structure

Lobsters are known to migrate seasonally in response to the seasonal change in water temperatures and climate conditions. They migrate to shallow waters in the spring to moult, reproduce or hatch eggs and return to deeper waters in the fall. The movement or migrations of adults can be extensive and cover considerable distances (Campbell et al. 1984). There is evidence that some females and males in the southern New England continental shelf undergo seasonal return migrations of up to 200 km (Uzmann et al. 1977). Tagging studies have shown a fair exchange of mature lobster between inshore and offshore waters off southwestern NS, with few lobsters reaching as far afield as Georges Banks (Campbell and Stasko 1985; Campbell 1989). However, long-range movement of adult lobsters from the outer Atlantic coast of Nova Scotia to offshore banks is extremely rare and there are no records of long-range movements of adult lobsters out of or into the Gulf of St Lawrence (Harding et al. 1997). A tagging study by Bowlby et al. (2008) showed that stock mixing among management zones (LFAs) was not observed.

Lobster larval dispersal and circulation patterns suggest that there is likely a high degree of connectivity between exploited populations in the Northwestern Atlantic. Larval dispersal and population genetics studies in the Southern Gulf of St Lawrence (SGSL) all suggest that the lobster population in this region can be considered homogeneous (Harding et al. 1997; Chassé and Miller 2010). Harding et al. (1997)

¹ <http://www.fao.org/fishery/species/3482/en>

² <http://www.dfo-mpo.gc.ca/Science/publications/uww-msm/articles/americanlobster-homarddamerique-eng.html>

indicated that lobsters from the Southern Gulf of St Lawrence, Nova Scotia and Georges Bank are not genetically isolated. However, the authors observed that Gulf of St Lawrence lobsters were about three times as genetically distant from Nova Scotia and Georges Bank lobsters. This slight genetic distinction might have evolved in response to the predominantly “one way” drift of larvae from the Gulf of St Lawrence, forming a partial hydrographic barrier to gene flow. In a more recent genetic study, Kenchington et al. (2009) found that samples in the Gulf of St. Lawrence, with low genetic differentiation, differed from samples from Fundy to Cape Cod, in which genetic differentiation is higher. This is postulated to result from a shelf-edge post-glacial colonisation process, in which lobsters forced onto the southern continental slopes by low temperature and falling water level during the last ice age later re-colonised northwards along the slope and into newly available embayments as the ice retreated, thus creating a south-north genetic difference that is now maintained by contemporary patterns of bathymetry, temperature, and circulation. Deep water lobster populations along the shelf could then be a relic of this post-glacial expansion.

As a result, lobsters in the SGSL, East Scotian Shelf, Southwestern Scotian Shelf and Bay of Fundy are considered as distinct biological units, and the management of lobster fisheries at the LFA level and the defined units of certification can therefore be considered appropriate.

Habitat

Lobsters inhabit areas from the water line out to the edge of the continental shelf, show habitat preference for hard substrates with shelters, but they may inhabit areas with sandy and muddy bottoms. This species is found in waters ranging between -1.5° and 24°C³.

Growth and moult

American lobster, like all crustaceans, grows incrementally in distinct moulting events called ecdysis. Although growth appears to take place entirely during the moult, lobsters actually spend much of their lives preparing for, or recovering from, moulting (Waddy et al. 1995). Growth rates are affected by two separate components, the size increase per moult, or moult increment, and the frequency of moulting. Moult increments are reported as a percent change in carapace length or as the actual change in carapace length per moult. During the moult, the carapace of the cephalothorax splits in two, and the lobster pulls its body through first, then its claws, its legs and its tail. The lobster is soft and approximately a month is needed for the new carapace to harden completely. After having moulted, lobsters are 15% to 20% larger than before and their weight increases approximately by 40% to 50%⁴. During the first year of their life, lobsters will grow quickly, moulting four to five times per year. Mature males and females moult annually until they get larger/older when moult frequency declines. In the SGSL, it typically takes 15 to 20 moults for lobsters to reach minimum legal harvesting size over a period of six to nine years (DFO 2012a). Off southwestern NS and the Bay of Fundy, lobsters are thought to take 8-10 years on average to reach the legal size of 82.5 mm CL (DFO 2013d).

³ <http://www.dfo-mpo.gc.ca/science/publications/uww-msm/articles/americanlobster-homarddamerique-eng.html>

⁴ <http://slgo.ca/en/lobster/context/cycle.html>

Life cycle

The life history of lobster is divided into a planktonic and a benthic life stage (Figure 2). Planktonic larvae hatch from eggs with female brood externally during the summer. Following metamorphosis, post larval lobster settles to the substrate to begin their benthic life.

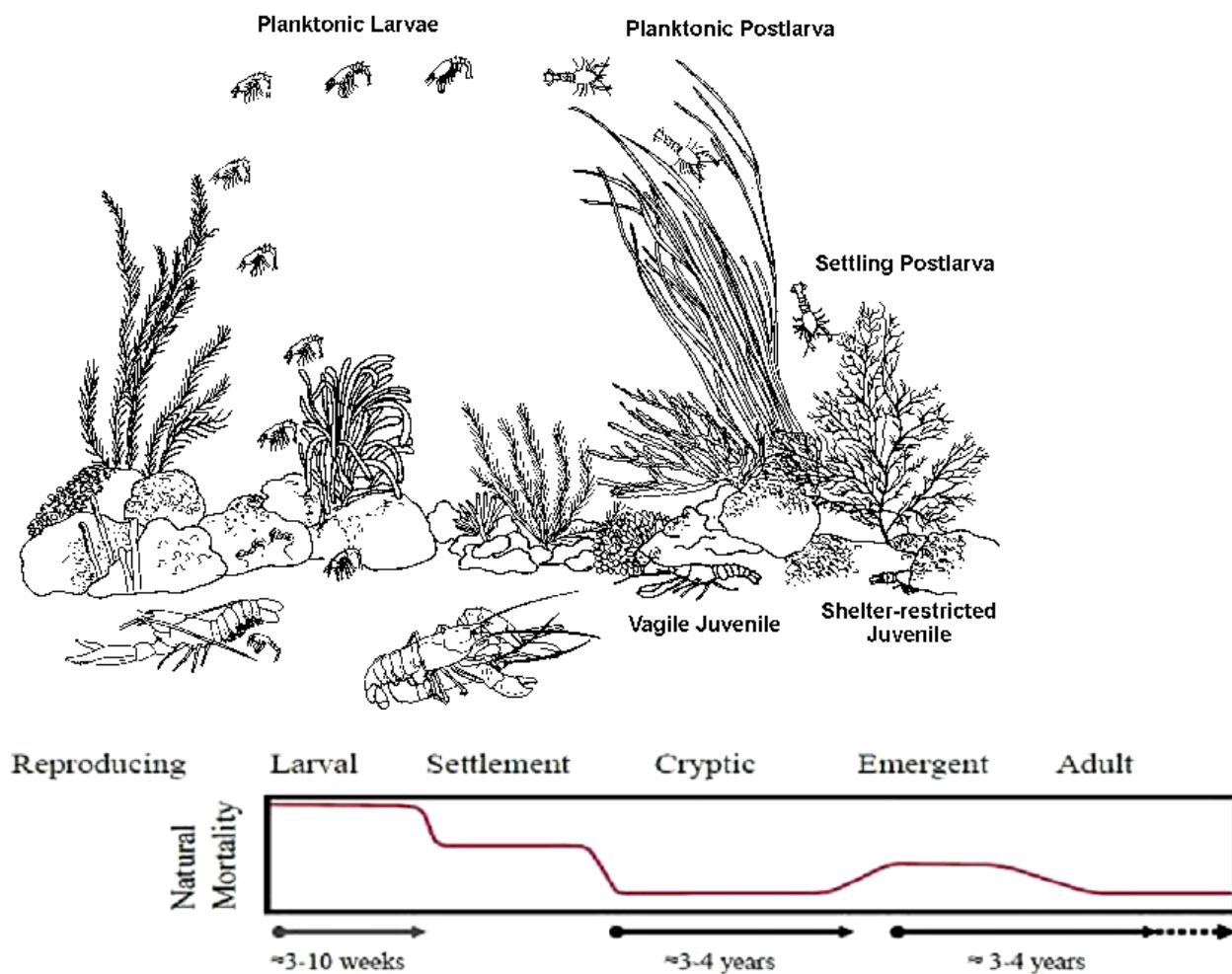


Figure 2. Life cycle of *Homarus americanus*. Source: Templeman 1937 (panel above) and DFO 2012a (panel below).

Reproduction

Lobsters migrate to shallow waters in the spring to moult, reproduce or hatch eggs. Males become sexually mature at smaller sizes and ages than females. Comeau and Savoie (2002) indicated that females lobster in the SGSL have a size at 50% maturity (SOM_{50}) between 68.7 and 73.3 mm carapace length (CL). More specifically, in most of the SGSL, SOM_{50} is 72 mm CL (DFO 2013b). Off the eastern Cape Breton (NS), female lobster SOM_{50} is between 71.5 and 75.8 mm CL (DFO 2011). Off southwestern NS and Bay of Fundy, most females mature between 90 and 105 mm CL (DFO 2013d). Typically, when a mature female lobster is about to moult, she seeks a mate and moves into his shelter. A few to

several days later, she moults inside this shelter. It takes about 1/2 hour for her shell to harden enough to permit her to stand. The male then approaches, and helps her to roll over. The pair fan their pleopods against one another just before the male intromits. Copulation lasts a few seconds, after which the female tail flips out from under the male. The female remains in the male's shelter for one to several more days (Cowan and Atema 1990). After mating, the female keeps the male's sperm for several months (up to one year and even more). For most females, eggs will be laid the year after mating. Eggs are becoming evident on the underside of the female approximately one year later (berried female). The number of eggs produced by a female, from a few thousand to several tens of thousands, depends on her size. Also, first-time spawners produce eggs of lower quality than those of older females. The female carries her eggs for almost a year and hatching of eggs occurs in summer when water temperature increases. The survival rate of eggs is very low, and only an estimated 1 out 10,000 larvae will survive to become adults.

Preys and predators

Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae)⁵. Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Stomach analysis in Northumberland Strait showed that rock crab was the single most important component of the diet (between 45 and 68% of prey biomass) (Hanson 2009). Small sea stars and lobster represented between 0.7 and 12.9% of the prey biomass. Molluscs, polychaetes, and fish remains each did not exceed 7.5% of prey biomass. Predation on planktonic stages of lobster is rare and predation upon benthic stages of lobster is uncommon, principally restricted to finfish (sculpin and cod) and cannibalism (during the moult). DFO investigated lobster and predator-prey relationships using samples collected during trawl surveys in part of LFA 26 (Comeau et al. 2008). Stomach analysis showed that decapods were the principal prey (57% to 84% of prey biomass), with rock crab being the single most important component of the diet (45% to 78%). Lobster represented 8% to 13% of the prey biomass. It has also been observed that the only demersal fish demonstrated to consume large amounts of lobster was the sculpin.

4.2.2. Fishing area

UoC 1

There are five LFAs in the SGSL, LFA 23, 24, 25, 26A and 26B but only four adjacent to NB and NS. The NB lobster harvesters have access to LFAs 23 and 25, and the NS lobster harvesters have access to LFAs 25, 26A and 26B as described in the Schedule XIII/Annexe XIII of the Atlantic Fishing Regulations (AFR), 1985⁶. The fishing activity is concentrated on rocky reefs, the preferred habitat of lobster, located in the coastal and nearshore areas of NB and NS. LFA 23 includes the southern half of the Bay of Chaleurs, all of the coast of the Acadian peninsula, and Miramichi Bay. LFA 25 includes the northwestern part of Northumberland Strait between NB and Prince Edward Island. LFA 26A includes the southeastern part of Northumberland Strait between NS and Prince Edward Island and the half between Prince Edward Island and Cap Breton, NS. LFA 26B includes the eastern half of Northumberland Strait between Prince Edward Island and Cape Breton, NS and the entire western coast of Cape Breton, NS.

Latitude and longitude positions are outlined in Schedule XIII of the AFR.

⁵ <http://slgo.ca/en/lobster/context/foodchain.html>

⁶ <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-21/page-42.html#docCont>



Figure 3. LFAs in the Southern Gulf of St. Lawrence⁷.

By 2008, LFA 23 was divided into three sub-LFAs, 23A and 23B within Bay of Chaleurs, 23C on the Gulf-side, and LFA 26B into two management zones, 26B north and 26B south. The following year, sub-LFA 23C was further divided with the southern area becoming sub-LFA 23D (Figure 4). By 2008, LFA 26A had one sub-LFA, LFA 26A2, and two management zones, LFA 26A1 and LFA 26A3 (Figure 4). A sub-LFA is defined as a portion of a LFA where lobster fishing can occur, the number of lobster licences is capped to a maximum amount, and licence conditions are specific to the sub-LFA. Conversely, a management zone is to accommodate differences in management measures within a defined geographical area to which specific licence conditions apply. Different management measures are implemented in these sub-LFAs and management zones.

In LFA 26A, NS lobster harvesters fish in management zones 26A1 and 26A3 and sub-LFA 26A2.

⁷ <http://www.glf.dfo-mpo.gc.ca/Gulf/Fishing-Area-Maps/Lobster#24>

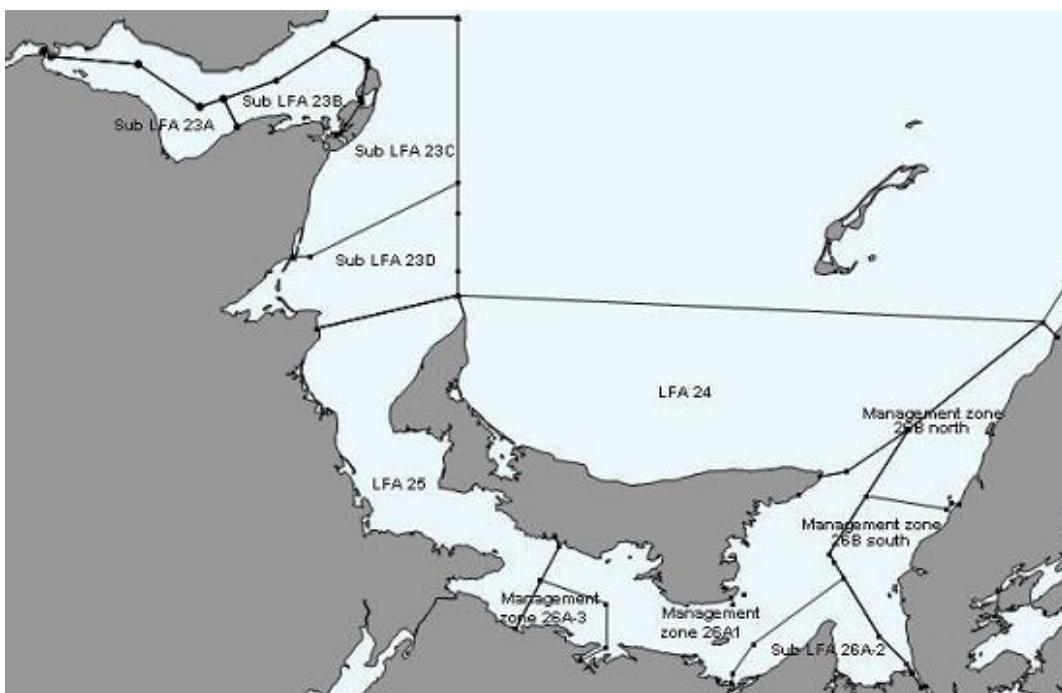


Figure 4. Map of LFAs and sub-areas in the SGSL. Source: DFO 2013 (Draft).

UoC 2

LFAs 27-33 stretch from the northern tip of Cape Breton Island to Barrington Bay in the south (Figure 5). Geographic areas associated with LFAs 27-33 are Eastern Cape Breton, the Eastern Shore and the South Shore of Nova Scotia. More specifically, LFA 27 includes the Northeastern Cape Breton, LFAs 28-32 include the Southeastern Cape Breton, Chedabucto Bay and the Eastern Shore, and LFA 33 includes the South Shore. Latitude and longitude positions are outlined in Schedule XIII of the AFR.

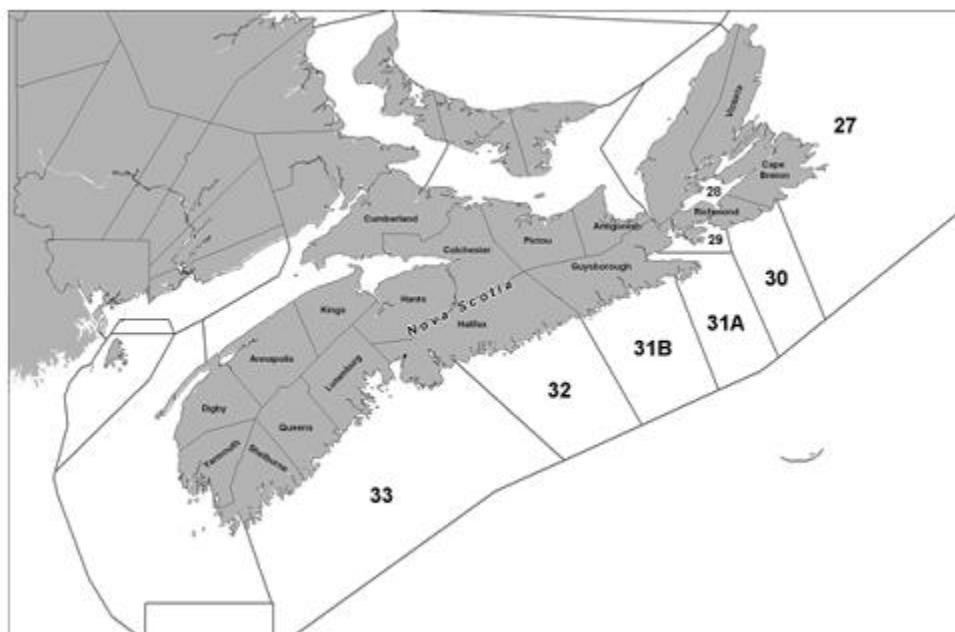


Figure 5. Map of LFAs 27-33. Source: DFO 2011b.

UoC 3

LFA 34 includes the Southwest part of Nova Scotia (Figure 6). Latitude and longitude positions are outlined in Schedule XIII of the AFR.

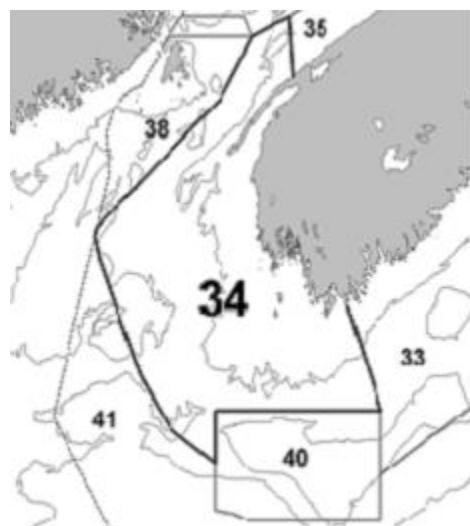


Figure 6. LFA 34 and adjacent LFAs. Source: DFO 2013d.

UoC 4

The NB lobster harvesters have access to LFAs 35-38 as described in the Schedule XII/Annexe XIII of the AFR. The NS lobster harvesters have access to LFA 35 as described in the Schedule XII/Annexe XIII of the AFR. LFAs 35-38 cover the entire Bay of Fundy located on the northeast end of the Gulf of Maine between NB and NS (Figure 7).

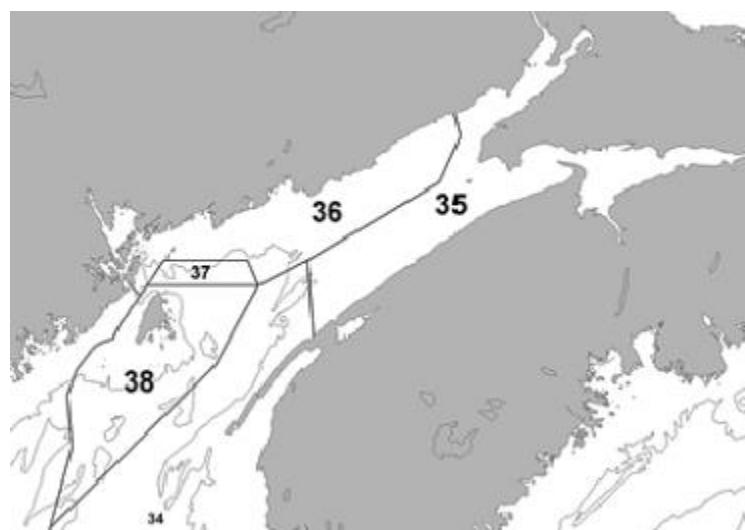


Figure 7. Maps of LFAs 35-38. Source: DFO 2013e.

4.2.3. History of lobster fisheries

4.2.3.1. Southern Gulf of St. Lawrence (UoC 1)

Catch records of the lobster fishery of the entire SGSL begin in the mid-1800s (DFO 2012b). Until the latter half of the 1800, lobster markets were limited to local consumption as transportation systems were not developed enough to allow highly perishable lobster to be shipped any great distance. The beginning of the commercial fishery actually followed the invention and evolution of the canning process. For over a century, the fishery occurred as a nearshore, small-boat fishery, with a large number of participants. Lobster landings increased sharply (>2.5-fold) beginning in the mid-1970s, and reached a record reported catch of 22,099 t in 1990 (Figure 8). After declining to 15,472 t in 2005, reported catches increased again in 2010. Preliminary landings in 2011 (18,964 t) were 73% above the long-term median value (10,933 t) observed between 1947 and 2011. Although part of the recent increase in landings could be attributed to an increase in egg production, favourable environmental factors are thought to be responsible for strong lobster recruitment success which has resulted in very high catches over most of its northern range.

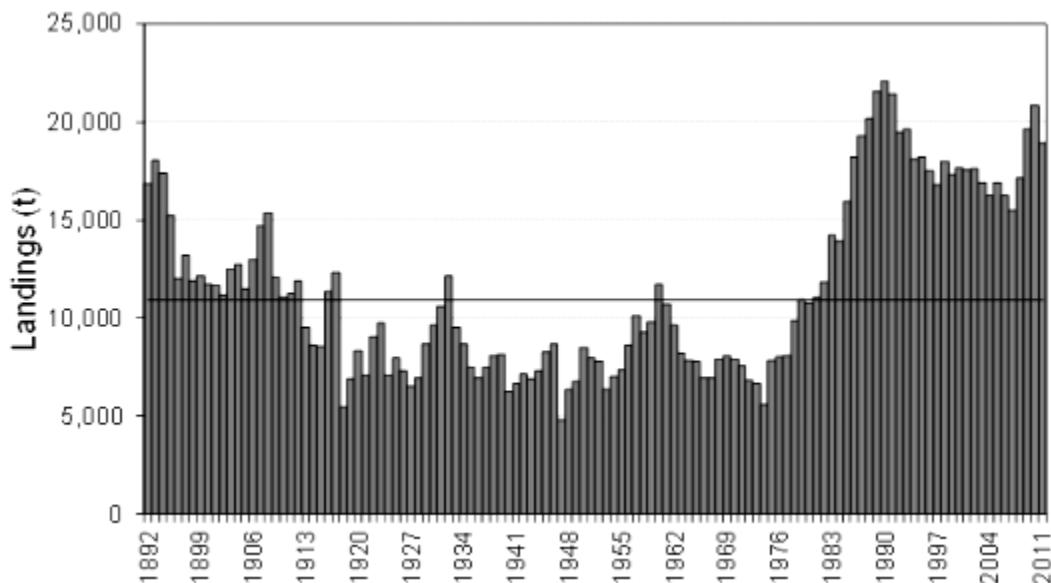


Figure 8. Historical lobster landings (t) in the SGSL from 1892 to 2011 (data for 2011 are preliminary). The horizontal line is the median landing of the time series for 1947 to 2011. Source: DFO 2013b.

The first Fisheries Act was enacted in 1868 (DFO 2012a). The first known regulation in 1873 forbade the taking of egg-bearing female weighing less than one and a half pounds as well as soft-shelled, newly moulted lobsters. In 1874, the first closed season was established during July and August to protect lobster during the spawning period. In 1874, the first size limit of nine inches overall length was established. Today, the regulated minimum carapace size of lobster is set with the objective of ensuring at least 50% of female lobsters reach sexual maturity before capture.

The first attempt at regulating the configuration of traps occurred in the early 1890s, with the introduction of minimum lath spacing in traps to provide a means of escape for small lobsters.

In April 1969, Sunday fishing for lobster was banned. This ban remained in effect until 1984 when it was challenged and deemed unconstitutional. In 1984, LFAs were established.

The lobster fishery has been the subject of two reviews by the former Fisheries Resource Conservation Council (FRCC 1995, 2007). Two multiyear conservation plans (1998-2001, 2003-2005) were developed and included increased minimum carapace size, buffer zone to protect habitat, increased trap escape panel size, biodegradable panels and important reductions in fishing effort through licence retirement (reducing the number of harvesters), reduction of the number of traps occurred, and fishing only six days per week. The creation of the Atlantic Lobster Sustainability Measures (ALSM) program in 2009⁸ helps Canada's lobster fishery to ensure its long-term sustainability and economic prosperity. The program supports industry efforts to maintain healthy lobster stocks in all Lobster Fishing Areas, and improve lobster abundance in areas where stocks have declined. It also supports economic prosperity by helping to set the conditions for commercial success.

Lobster can only be retained if they comply with a minimum legal size (MLS) designed to allow 50% of females to reach sexual maturity before being harvested. Modified biodegradable panels became mandatory in 2013 for all LFAs in the SGSL (DFO 2013a).

4.2.3.2. Maritimes (UoCs 2, 3 and 4)

Commercial lobster fishing began in mid-1800s and annual landings for the east Scotian Shelf were first recorded in 1892.

In LFA 27, landings remained relatively constant through the 1892-1965 period (Figure 9). A decline in the 1970s was observed. Landings rose to unprecedented levels during the 1980s and peaked in 1990 followed by a similar sharp decline before levelling out in 1997 (Figure 9). Landings have increased since 2000, with the mean of the last 3 years approximately 1.3 times the median landings for the period 1985-2004.

LFAs 28-31 exhibited the large decline during the 1890s and early 1900s followed by smaller peaks in the early 1930s and mid-1950s (Figure 9). Landings increased during the 1980s and peaked in 1990. Landings rose sharply between 2004 and 2009, with 2009 landings 4.5 times those of 2004 and almost matching the all-time highs of 1895.

LFAs 32-33 exhibited large decline during the 1890s and early 1900s, followed by low landings through the 1930s and 1940s (Figure 9). A small increase is evident in the early 1950s but by the 1960s is in decline reaching all-time lows in the late 1970s. Landings peaked in 1987, followed by a decline in the early 1990s. Landings have increased since 2004, and 2009 landings are at 1.4 times the peak of 1987 and 16 times the record low of 1978, although still below the all-time highs of the 1890s.

⁸ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/lobster-homard/alsm-mdih-eng.htm>

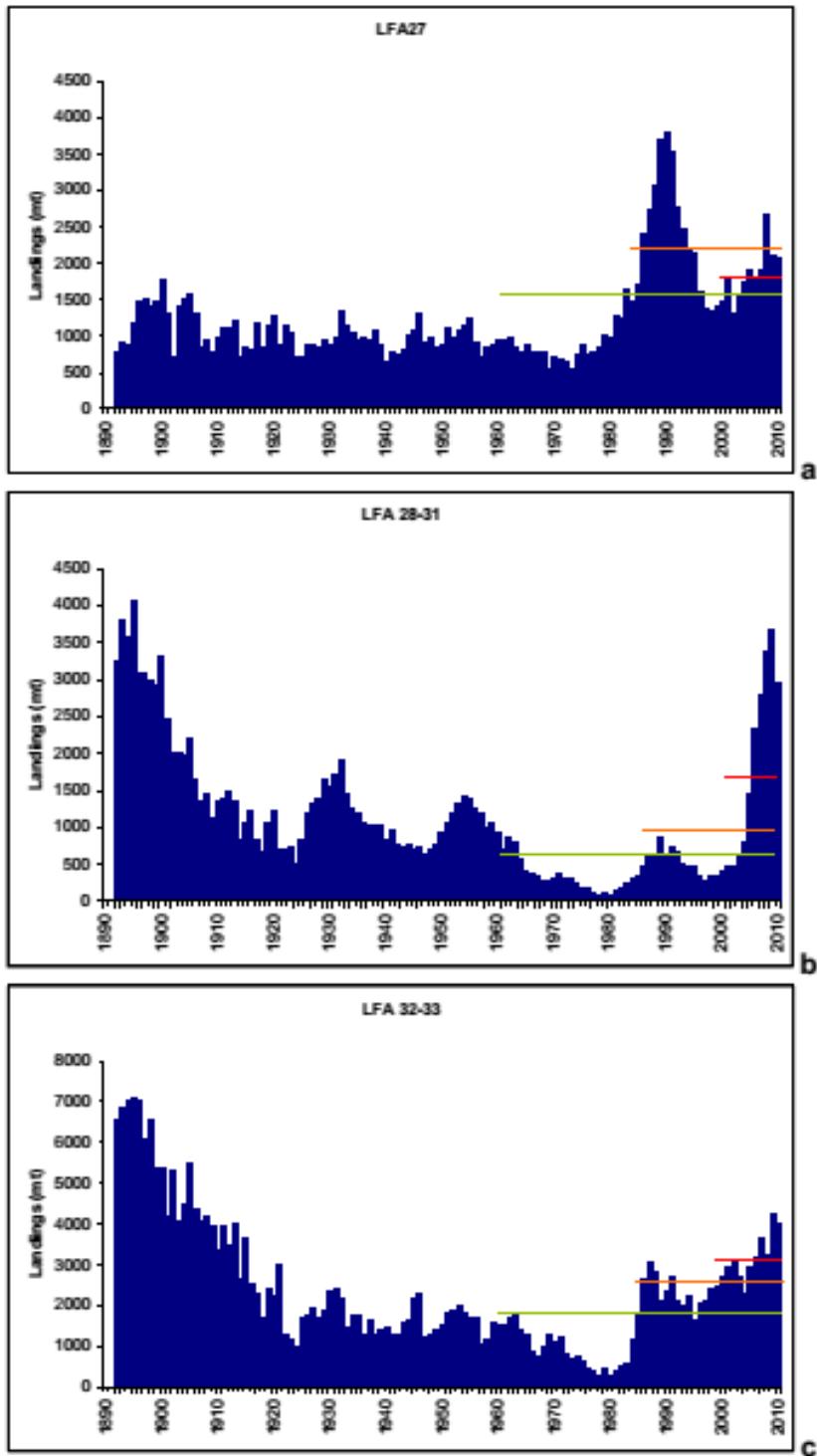


Figure 9. Lobster landings 1892-2010 (2010 preliminary) a) LFA 27, b) LFA 28-31, c) LFA 32-33; showing mean landings for recent 10yr —, 25yr —, and 50yr —. Source: Tremblay et al 2011.

Commercial lobster fishing began in the mid-1800s and the annual lobster landings for LFA 34 were first recorded in 1893. Landings peaked in 1898 and were followed by a decrease to 1,600 t in the early 1930s (Figure 10). Landings rose following the World War II, varying between 2,200 and 4,500 t until the

1980s. Landings began a long-term increase in the 1980s and recent landings are at record highs. This increasing trend is part of a pattern that extended over most of the range of lobster in the western Atlantic.

Fishing prior to the early 1980s occurred in traditional near-shore grounds. Beginning in the late 1970s, a few near-shore vessels in LFA 34 began to expand out from the traditional near-shore grounds (< 55 m depth) and fished German Bank, Browns Bank, and Tusket Basin. By the mid-1980s, approximately 100 vessels were fishing this deepwater area referred to as mid-shore. Since mid-1990s, there has been an increase in the number of large vessels capable of fishing further from shore and in almost any weather.

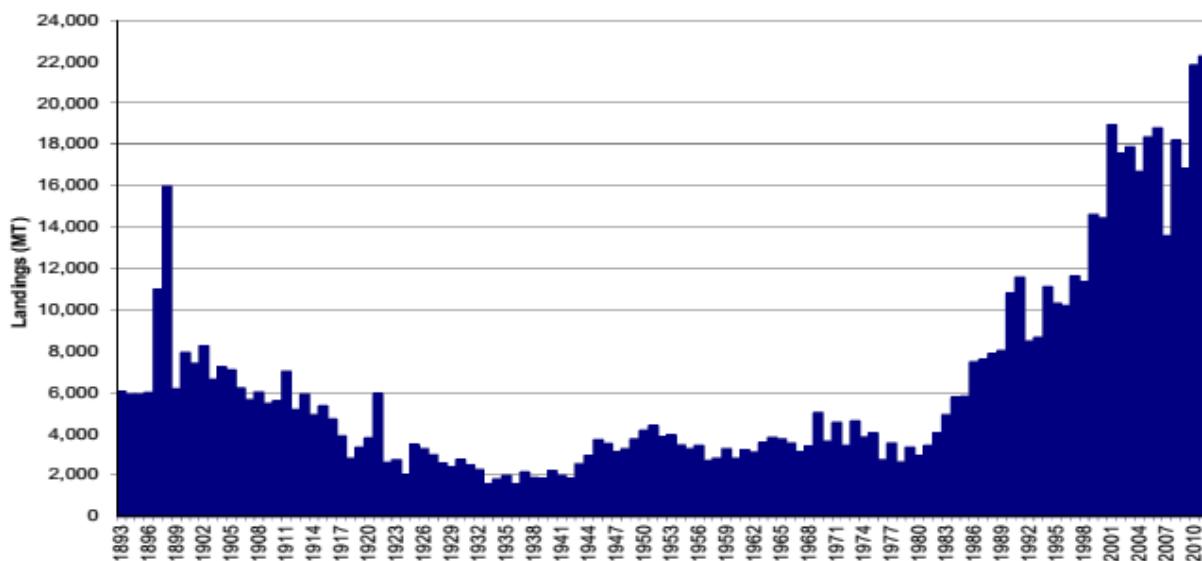


Figure 10. Annual lobster landings in LFA 34, 1893-2011. Source: DFO 2013d.

Commercial lobster fishing began in mid-1800s, and annual landings for the Bay of Fundy (LFAs 35-38) were first recorded in 1893. In the Bay of Fundy, the landings peak in 1896 (2,791 t) was followed by a decline to 53 t in the early 1900s (Figure 11). Landings rose again until 1909 and then trended downwards until the late 1930s. Annual landings rose following World War II and were relatively stable for 20 years before declining to a low point in 1976. From 1986-87 to 1993-94, seasonal landings were stable with a mean of 994 t. Since the mid-1990s, there has been an unprecedented increase in landings. This increase trends is part of a pattern that extended over most of the range of lobster in the western Atlantic.

During the early part of the Bay of Fundy fishery, management regimes evolved independently in each lobster fishing area. As a consequence of improvement in technology, such as hydraulic haulers, bigger and faster boats, Loran C and eventually GPS, and changes in the way that lobster fishing was conducted, outer boundary lines were established between LFAs in 1986. Evidence based on information from the grid based logbooks introduced in 2003 indicates that an important component of the Bay of Fundy lobster fleet has expanded their fishing effort to deeper water further from shore and from their home port.

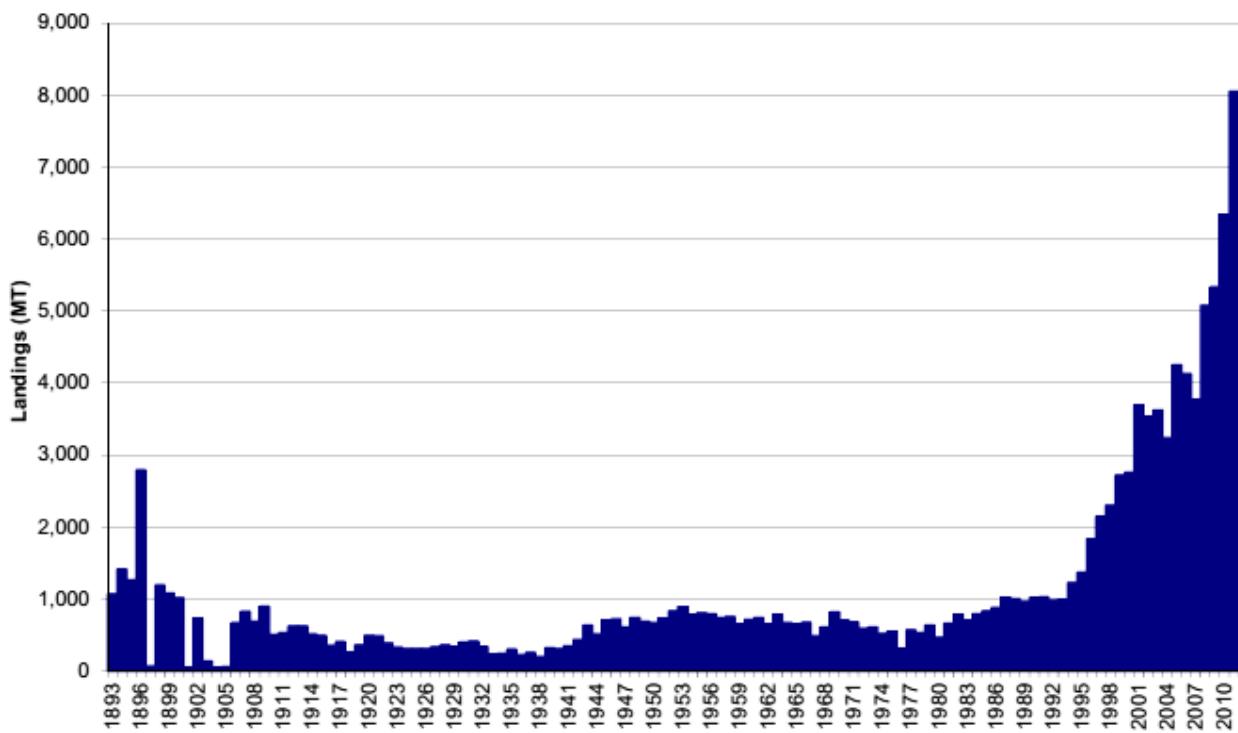


Figure 11. Annual lobster landings in the Bay of Fundy (LFA 35-38), 1893 to 2011. Source: DFO 2013e.

Since the late 1800s, numerous regulations have been applied to the Maritimes lobster fisheries (DFO 2011a). The first Fisheries Act was enacted in 1868 (DFO 2012a). In 1873, the first regulatory measures were introduced to establish restrictions on soft shell lobster and egg bearing females. Fishing seasons were introduced in the Bay of Fundy area as early as 1879, with additional size restrictions coming into play in 1899. Following almost a century of varied and inconsistent management and regulatory approaches, the present day fishery is the result of number of initiatives first introduced in the late 1960s.

In 1978 to 1981, a lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery.

In the mid to late 1980s, regulations were strengthened to include requirements for escape vents and biodegradable panels to be installed in lobster traps.

Lobster fisheries have been the subject of two reviews by the former Fisheries Resource Conservation Council (FRCC 1995, 2007). A four-year conservation plan (1998-2001) was developed to achieve the target of doubling the eggs per recruit.

The creation of the Atlantic Lobster Sustainability Measures (ALSM) program in 2009⁹ helps Canada's lobster fishery to ensure its long-term sustainability and economic prosperity. The program supports industry efforts to maintain healthy lobster stocks in all Lobster Fishing Areas, and improve lobster abundance in areas where stocks have declined. It also supports economic prosperity by helping to set the conditions for commercial success.

Lobster fisheries are managed by input control including a minimum legal size, prohibition of landings berried females, and limited entry, seasons and trap limits.

⁹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/lobster-homard/alsm-mdih-eng.htm>

4.2.4. Catches

Lobster landings in NB and NS for 2009, 2010, 2011, 2012 and 2013 (preliminary for the last 3) are shown in Table 1. Combined landings of NB and NS represented 72%, 74%, 77%, 75 and 74% of Atlantic Canada total landings in 2009, 2010, 2011, 2012 and 2013 respectively. Landings by UoC are detailing below.

Table 1. Lobster landings (t) by NS and NB fishermen per region. Source: DFO Statistics¹⁰.

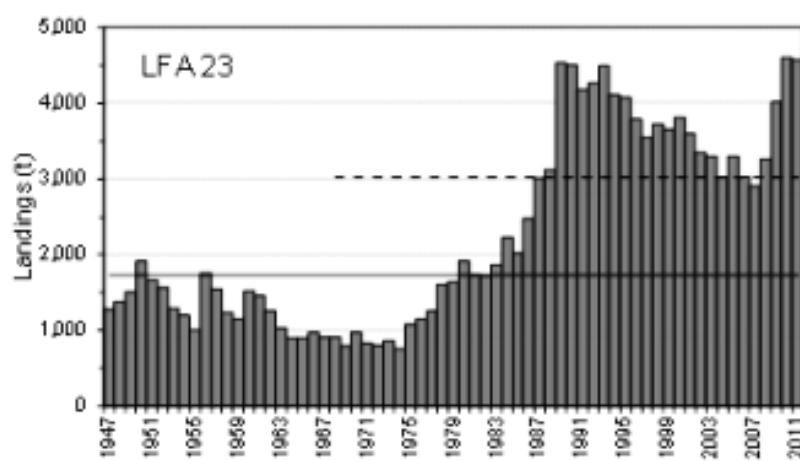
	Nova Scotia			New Brunswick			TOTAL
	Maritimes	Gulf	Total	Maritimes	Gulf	Total	
2009	28,457	2,981	31,457	3,892	6,459	10,351	41,808
2010	34,852	3,092	37,945	4,458	7,283	11,741	49,689
2011p	36,447	2,935	39,382	5,396	6,993	12,389	51,771
2012p	39,427	3,622	43,049	5,743	7,741	13,484	56,533
2013p	35,326	4,395	39,721	6,197	9,324	15,521	55,242

4.2.4.1. Southern Gulf of St Lawrence (UoC 1)

Landings (DFO 2008 and 2013b)

LFA 23

Lobster landings in LFA 23 showed small fluctuations with a median landings of 1,175 t between 1947 and 1974, followed by a sharp increase from 759 t in 1974 to the highest recorded landings of 4,528 t in 1989 and 1990, representing approximately a 6-fold increase in 16 years (Figure 12). Since 1993, landings in LFA 23 have been declining. In 2005, 2,907 t were landed, representing a 35% reduction from the peak landings observed in 1989, but still 79% above the long-term median landings (1,626 t) observed between 1947 and 2004. Preliminary landings for 2011 (4,576 t) were 2.5 times the long-term median (1,732 t).



¹⁰ <http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritime-eng.htm>

Figure 12. Reported lobster landings (t) in LFA 23, 1947 to 2011. The solid horizontal line is the median value for the 1947 to 2011 (long-term) and the dashed horizontal line is the median value for 1968 to 2011 (mid-term). Source: DFO 2013b.

LFA 25

Total landings trend in LFA25 is characterized by wide fluctuations with no stable period since 1947 (Figure 13). Landings showed a sharp increase from 1,622 t in 1947 to the highest recorded landings of 6,323 t in 1985, representing an almost 4-fold increase in 12 years. Within the SGSL, LFA 25 was the first one to reach its record high landings. Since 1985, however, landings in LFA 25 have been steadily declining. Landings in 2002 were below the mid-term median value (3,542 t) and slightly above the long-term median value (3,155 t). Landings in 2003 fell below the long-term median value, and in 2005, 2,419 t were landed, which represented a 62% reduction from the peak landings observed in 1985. Since 2009, landings are above both long-term and mid-term median values. Preliminary landings in 2011 (4,015 t) were 27% above the long-term median value.

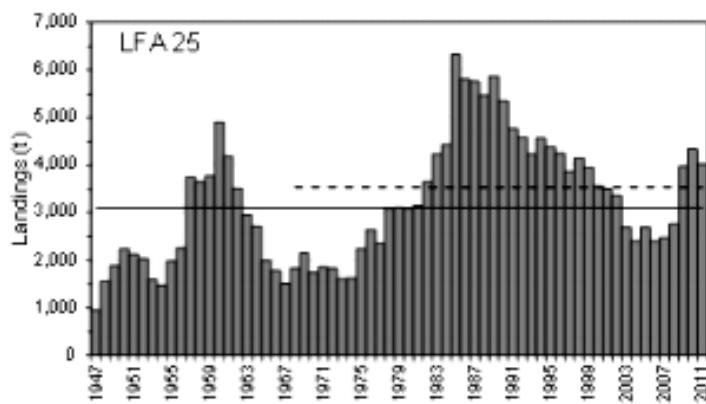


Figure 13. Reported lobster landings (t) in LFA 25, 1947 to 2011. The solid horizontal line is the median value for the 1947 to 2011 (long-term) and the dashed horizontal line is the median value for 1968 to 2011 (mid-term). Source: DFO 2013b.

Lobster landings by NS and NB fishermen are shown in Table 2. In 2011, these landings represented 59% of LFA 25 total landings.

Table 2. Lobster landings (t) by NS and NB fishermen for LFA 25. Source: DFO Gulf Region during April 2014 site visit.

Years	Landings by NS and NB fishermen
2009	2,453
2010	2,699
2011p	2,367

LFA 26A

LFA 26A is characterized by total landings from 1947 to 1982 below or equal to the long-term median value (2,893 t). After the lowest recorded landings of 1,372 t in 1974, there was a sharp increase to the highest recorded landing of 6,691 t in 1988, representing a 4-fold increase (Figure 14). Following this

peak, a rapid decline to 3,480 t in 1994 was observed. Since then, landings are somewhat stable at a median of 3,637 t, which is slightly above the mid-term median value. The preliminary 2011 landings of 3,866 t were 34% above the long-term median.

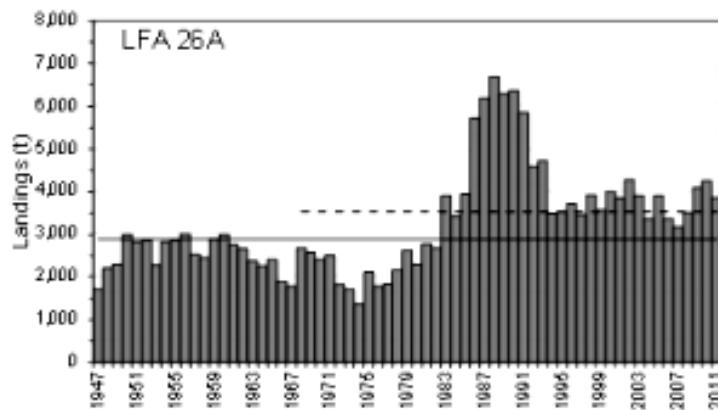


Figure 14. Reported lobster landings (t) in LFA 26A, 1947 to 2011. The solid horizontal line is median value for the 1947 to 2011 (long-term) and the dashed horizontal line is the median value for 1968 to 2011 (mid-term). Source: DFO 2013b.

Lobster landings by NS fishermen are shown in Table 3. In 2011, these landings represented 44% of LFA 26A total landings.

Table 3. Lobster landings (t) by NS fishermen for LFA 26A. Source: DFO Gulf Region during April 2014 site visit.

Years	Landings by NS fishermen
2009	1,781
2010	1,850
2011p	1,695

LFA 26B

Lobster landings in LFA 26B showed a relatively stable trend between 1947 and 1977 with a median at 495 t (Figure 15). A 3.8-fold increase was observed between 1974 (408 t) and 1991 (1,543). Landings then dropped 28% in four years to 1,110 t in 1994, following by stable landings. A median landing of 1,102 t has been observed for the past 18 years that represent a 2.2-fold increase from the previous median observed between 1947 and 1977. The fishery in LFA 26B was stable with a recorded landings in 2011p of 1,037 t, which was still 48% above the long-term median landings (700 t) observed in the past 65 years, and within the mid- (1,074 t) and short- (1,083 t) term median landing values.

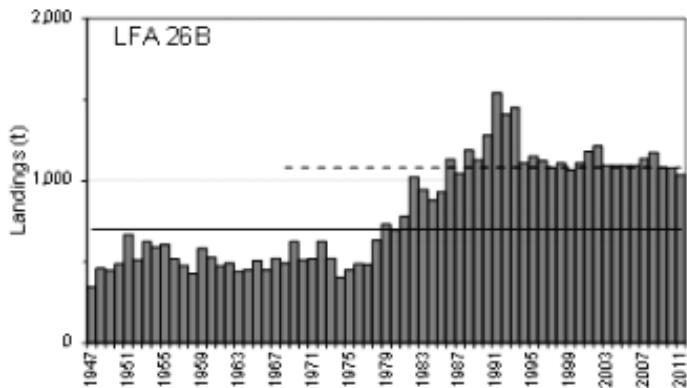


Figure 15. Reported lobster landings (t) in LFA 26B, 1947 to 2011. The solid horizontal line is median value for the 1947 to 2011 (long-term) and the dashed horizontal line is the median value for 1968 to 2011 (mid-term). Source: DFO 2013b.

CPUE (DFO 2013b)

CPUE trends (see Figures 21-22 in section 4.3.1.2) are derived from at-sea sampling activities (in kg and number/trap haul). Data were available in sub-region 26ANS to define an indicator. The highest increase in CPUE was observed in LFA 25 with up to 5-fold increase in 2012 compared to 2006. The lowest CPUE (2011-2012) values both in number and in kg per trap were seen in sub-region 26AD.

4.2.4.2. Eastern Scotian Shelf (UoC 2)

Landings (DFO 2011b)

In LFA 27, landings rose to unprecedented levels during the 1980s and peaked in 1990 (3,970 t) followed by a similar sharp decline before levelling out in 1997 (Figure 16, Table 4). Landings have increased since 2000, with the mean of the last 3 years approximately 1.3 times the median landings for the period 1985-2004 (1,996 t). Lobster landings were 2,178 t and 2,568 t in 2009 and 2010, respectively (Table 4).

LFAs 28-32 had a peak in the mid-1950s followed by an all-time low in late 1970s (Figure 16). Landings increased during the 1980s and peaked in 1990. Landings rose sharply between 2004 (1,089 t) and 2009 (4,607 t) (Table 4). The mean of the last 3 years is approximately 5 times the median landings for the period 1985-2004 (822 t), and almost matches the all-time highs of 1895. 2010 landings were 3,866 t (Table 4).

In LFA 33, landings reached all-time lows in the late 1970s followed by an increase to peak in 1986-87 (2,794 t) (Figure 16, Table 4). Although landings declined in the early 1990s, they remained above levels observed since the 1920s have increased since 2004-05. The mean of the last 3 fishing seasons is approximately 1.5 times the median landings for the period 1985-2004 (2,071 t). Lobster landings were 3,402 t and 3,377 t in 2008-09 and 2009-10, respectively (Table 4).

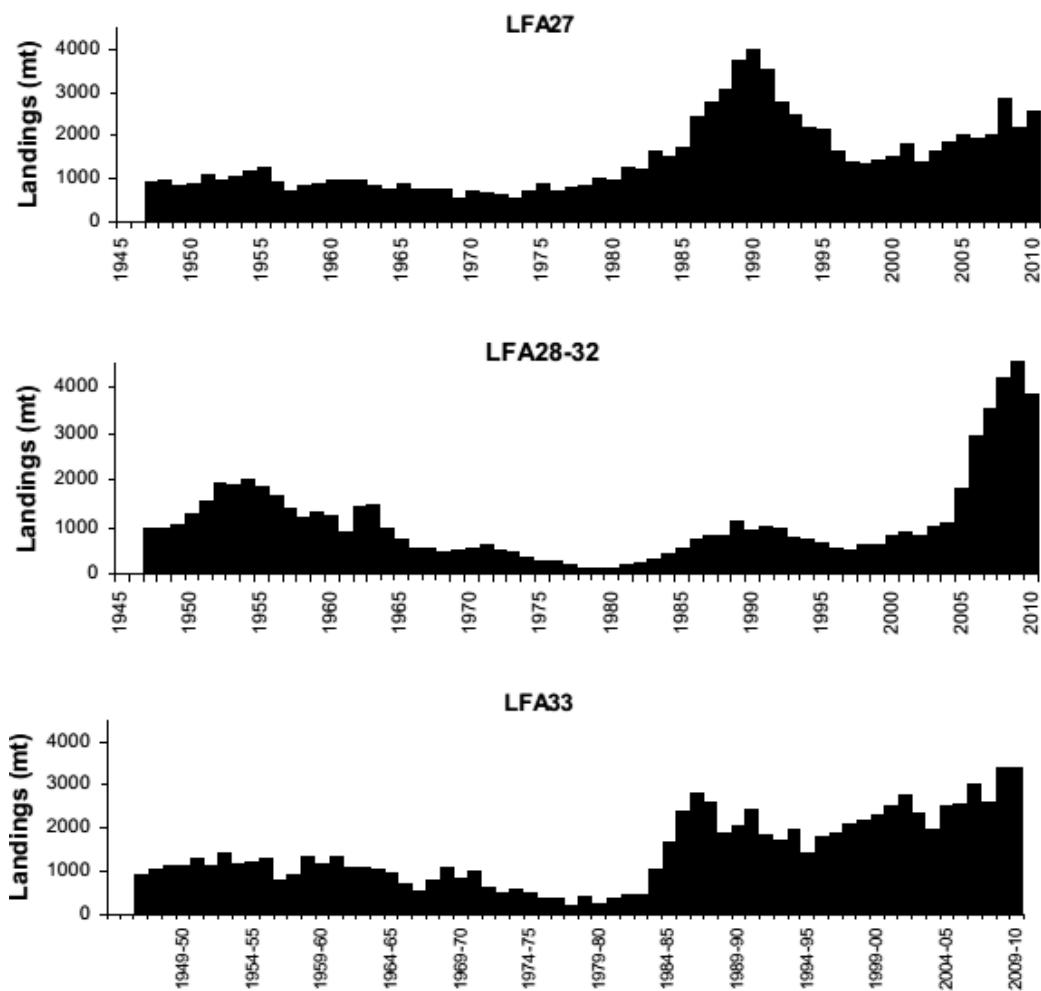


Figure 16. Lobster landings 1945-2010 for LFAs 27, 28-32, and 33. Source: DFO 2011b.

Table 4. Lobster landings 1980-2010 for LFAs 27-33 with 3 years mean (2008-2010). Source: DFO 2011b.

Year	LFA 27	LFA 28- 29	LFA 30	LFA 31	LFA 32	LFA 28-32	SEASON	LFA 33
1980	975	23	13	41	66	143	1979-80	248
1981	1267	45	35	70	56	206	1980-81	363
1982	1227	50	27	94	70	241	1981-82	448
1983	1658	63	62	120	109	354	1982-83	461
1984	1502	74	69	169	140	452	1983-84	1044
1985	1721	113	60	183	180	536	1984-85	1658
1986	2420	154	85	223	284	746	1985-86	2385
1987	2763	200	99	303	258	860	1986-87	2794
1988	3070	203	77	326	222	828	1987-88	2589
1989	3716	257	132	482	239	1110	1988-89	1888
1990	3970	172	119	365	303	959	1989-90	2037
1991	3526	168	151	401	298	1018	1990-91	2420
1992	2778	150	167	358	304	979	1991-92	1849
1993	2458	104	132	284	279	799	1992-93	1731
1994	2190	104	130	240	262	736	1993-94	1968
1995	2141	107	126	229	219	681	1994-95	1395
1996	1616	75	90	176	225	566	1995-96	1825
1997	1398	51	80	148	243	522	1996-97	1867
1998	1347	64	70	200	309	643	1997-98	2104
1999	1425	55	70	217	316	658	1998-99	2162
2000	1505	59	54	299	448	860	1999-00	2297
2001	1819	71	98	304	433	906	2000-01	2521
2002	1395	65	79	313	358	815	2001-02	2753
2003	1659	138	73	432	389	1032	2002-03	2320
2004	1850	198	84	518	289	1089	2003-04	1955
2005	2036	411	112	925	403	1852	2004-05	2519
2006	1966	668	187	1497	602	2954	2005-06	2556
2007	2024	800	216	1888	632	3535	2006-07	3033
2008	2849	1089	413	1993	704	4199	2007-08	2599
2009	2178	1099	452	2227	829	4607	2008-09	3402
2010	2568	926	371	1912	657	3866	2009-10	3377
Mean 2008-10	2532	1038	412	2044	730	4224		3126
Median 1985-2004	1996	110	88	301	287	822		2071

CPUE (Tremblay et al 2011)

Landings and effort data from the commercial logbooks and voluntary logbooks are used to calculate a total season CPUE (expressed in kg per trap haul).

From the commercial logbook, overall observation is that over the period of time the data is available, the catch rate is relatively constant in LFAs 27-33, although increased catch rate is observed in LFA 30 between 2007 and 2009, in LFA 31A between 2006 and 2009 and to a lesser extent in LFA 31B. All of these also show a small downturn in 2010.

The voluntary logbooks indicate that, in all the LFAs, a decline in CPUE is observed in the early 1990s followed by increased CPUE. The rate of this increase varies with the largest and most rapid changes

observed in LFA 31a and 31b. In this time series, the most current CPUE levels are the highest in LFA 31a, 31b and 32. In LFA 27 and 33, these levels are similar to those of the period of higher landings in the early 1990s.

4.2.4.3. Southwestern Scotia Shelf (UoC 3)

Landings (DFO 2013d)

LFA 34 has the highest lobster landings of the Atlantic Canada. Lobster landings in 2011-12 (Table 5, 23,292 t) are 2.7 times the 50-year annual mean (1961-2010, 8,575 t), 1.4 times higher than 2004-05 (17,250 t, latest year in the 2006 assessment), and last 3 years are the highest on record (Table 5).

Landings from midshore and offshore have increased substantially relative to the nearshore. Landings in the nearshore still comprise the bulk of the landings (63%) but have increased by a factor of just 1.2 since 2004-05. In the midshore and offshore, landings doubled relative to 2004-05. This continues a trend since data from logbooks became available in 1998-99. Relative to 1998-99 (nearshore: 10,492 t; midshore: 1,140 t; offshore: 193 t), 2011-12 landings in the inshore increased by 1.3 times, while landings increased to a much greater extent in the midshore (6,600 t; 5.8 times) and the offshore (1,526 t; 7.9 times).

Table 5. LFA 34 landings from 1975-76 fishing season to the 2011-12 fishing season, as of Jan 1, 2013. Values include commercial communal removals. Food, Social and Ceremonial (FSC) landings are not included but, given the effort deployed, are expected to be no more than 0.1-0.5% of the total in recent years. Source: DFO 2013d.

FISHING SEASON	Landings (t)	FISHING SEASON	Landings (t)
1975/1976	3,829	1994/1995	9,683
1976/1977	3,525	1995/1996	10,339
1977/1978	2,668	1996/1997	10,646
1978/1979	2,963	1997/1998	12,064
1979/1980	3,203	1998/1999	13,074
1980/1981	3,086	1999/2000	13,444
1981/1982	3,649	2000/2001	16,198
1982/1983	4,546	2001/2002	19,058
1983/1984	5,140	2002/2003	17,613
1984/1985	5,937	2003/2004	17,801
1985/1986	6,892	2004/2005	17,250
1986/1987	7,672	2005/2006	17,009
1987/1988	8,478	2006/2007	16,583
1988/1989	8,200	2007/2008	17,145
1989/1990	9,449	2008/2009	17,262
1990/1991	11,084	2009/2010	19,749
1991/1992	8,888	2010/2011	20,401
1992/1993	8,902	2011/2012	23,292
1993/1994	10,334		

CPUE (DFO 2013d)

Commercial CPUE (kg per trap haul, from commercial logbooks) in 2011-12 increased substantially from 2004-05 and from 1998-99. CPUE increased from 1998-99 to 2001-02, declined in 2004-05, remained steady for the next 5 years and increased to new highs in each of the last 3 years. The 2001-012 CPUE was the highest in 14 years.

The relative increase in CPUE was the highest in the midshore and offshore, and in terms of absolute values, the CPUE has been higher in the midshore and offshore throughout the time period. The higher CPUE in the midshore and offshore portions of LFA 34 provide an explanation for the shift in effort away from the nearshore.

4.2.4.4. Bay of Fundy (UoC 4)

Landings (DFO 2013e)

Current lobster landings are very high in the Bay of Fundy as a whole and in individual LFAs (Table 6). Landings in 2011-12 (8,467 t) were more than 5 times the 50-year annual mean (1961-2010 = 1,628 t), were more than 2 times higher than 2005-06 (4,125 t, latest year in the 2007 assessment), and each of the last 5 years has been a new record high.

Within the Bay of Fundy LFAs, the landings increase has been widespread. For example, from 2001-02 to 2011-12, landings increased by a factor of 2, 2.4, and 2.7 in LFA 36, 38 and 35, respectively.

CPUE (DFO 2013e)

Commercial CPUE (kg per trap haul, from commercial logbook) in the Bay of Fundy has increased in all LFAs since 2005-06. In the Bay of Fundy as a whole, the 2001-12 CPUE was 1.8 times that of 2005-06. This increase in CPUE, coupled with increased fishing effort explains the increase in landings in the Bay of Fundy since 2005-06.

Table 6. LFA 35-38 landings from 1975-76 fishing season to the 2011-12 fishing season, as of Jan 1, 2013. Values include commercial communal removals. Food, Social and Ceremonial (FSC) landings are not included but, given the effort deployed, are expected to be no more than 0.1-0.5% of the total in recent years. Source: DFO 2013e.

FISHING SEASON	LFA35	LFA36	LFA38	LFA 35-38
1975/1976	132	115	294	541
1976/1977	120	58	170	348
1977/1978	157	47	351	555
1978/1979	137	176	302	615
1979/1980	75	126	347	548
1980/1981	132	156	236	524
1981/1982	133	195	390	718
1982/1983	135	225	378	738
1983/1984	164	211	365	740
1984/1985	226	266	334	826
1985/1986	246	281	316	843
1986/1987	330	327	329	986
1987/1988	265	340	384	989
1988/1989	271	310	468	1,049
1989/1990	255	221	467	943
1990/1991	227	271	495	993
1991/1992	261	260	512	1,033
1992/1993	239	257	472	968
1993/1994	241	274	523	1,038
1994/1995	338	318	661	1,317
1995/1996	546	427	600	1,573
1996/1997	738	680	551	1,969
1997/1998	837	788	701	2,326
1998/1999	923	826	809	2,558
1999/2000	910	879	826	2,615
2000/2001	1,074	1,032	984	3,090
2001/2002	1,219	1,261	1,145	3,625
2002/2003	1,234	1,155	1,073	3,462
2003/2004	1,337	1,169	1,133	3,639
2004/2005	1,172	1,143	1,363	3,678
2005/2006	1,235	1,295	1,595	4,125
2006/2007	1,191	1,138	1,413	3,742
2007/2008	1,488	1,477	1,855	4,820
2008/2009	1,617	1,596	1,638	4,851
2009/2010	1,898	1,594	2,035	5,527
2010/2011	2,546	1,916	2,352	6,814
2011/2012	3,245	2,481	2,741	8,467

4.2.5. Fishing season

4.2.5.1. Southern Gulf of St Lawrence (UoC 1)

There are two distinct lobster fishing seasons in the Southern Gulf of St Lawrence, a spring fishery (LFAs 23, 26A and 26 B) and a summer/fall fishery (LFA 25) (Table 7).

Table 7. Lobster fishing season in the Southern Gulf of St Lawrence that were in effect in 2012. Source: DFO 2012b and DFO 2013b.

LFA and sub-area								
23				25	26A		26B	
23A	23B	23C	23D		26A1	26A2	26A3	North
April 28 to June 28		Aug. 13 to Oct. 14		May 1 to June 30	May 2 to June 30		May 1 to June 30	

For a portion of LFA 26A between Point Prim to Victoria, the fishery opened on May 6 and closed on July 8, 2012.

4.2.5.2. Eastern Scotian Shelf (UoC 2)

LFAs 27-32 are spring/summer fisheries while LFA 33 is a fall/winter/spring fishery (Table 8).

Table 8. Lobster fishing season in the eastern Scotian shelf as of 2010. Source: DFO 2011b.

LFA 27	LFA 28	LFA 29	LFA 30	LFA 31A	LFA 31B	LFA 32	LFA 33
May 15 to July 15	April 30 to June 30	April 30 to June 30	May 20 to July 20	April 29 to June 30	April 19 to June 20	April 19 to June 20	Last Monday Nov. to May 31

4.2.5.3. Southwestern Scotian Shelf (UoC 3)

Lobster fishery in LFA 34 is a fall/winter/spring fishery with a fishing season lasting from the last Monday in November to May 31 (DFO 2013d).

4.2.5.4. Bay of Fundy (UoC 4)

There are two distinct fishing season in LFAs 35 and 36, a fall/winter fishery and a winter/spring/summer fishery, while there is one fall/winter/spring fishery in LFA 38 (Table 9).

Table 9. Lobster fishing season in the Bay of Fundy. Source: DFO 2013e.

LFA 35	LFA 36	LFA 38
Oct 14 to Dec 31 ; Feb 28 to July 31	2 nd Tuesday in Nov to Jan 14; Mar 31 to June 29	2 nd Tuesday in Nov to June 29 LFA38B: June 30 to 2 nd Tuesday in Nov

4.2.6. Fishing method and fleet description

4.2.6.1. Southern Gulf of St Lawrence (UoC 1)

Table 10. Characteristics of the NB and NS lobster fleet and traps limits in the Southern Gulf of St Lawrence in 2012. Source: DFO 2012b, DFO 2013b, DFO 2013 Draft, DFO during April 2014 site visit.

	LFA 23				LFA 25	LFA 26A			LFA 26B			
	23A	23B	23C	23D		26A1	26A2	26A3	North	South		
Licence type A	572				393	304			202			
Licence type B	33				6	4			3			
Partnership	4				6	6			16			
Communal	60				84	22			6			
Total	669				489	336			227			
Number of traps per licence-A	300				250	280	275	250	250			
Traps per line	na	na	3	na	5	6	2	5	na			
Trap overall dimensions (cm)	Length = 125, Width = 90, Height = 50											
Rectangular escape mechanism height and width (mm) in parlor section of trap	Dimensions adapted to the minimum legal carapace size in effect (see below)											
Biodegradable mechanism in the parlor section	Dimensions of unobstructed opening not less than 89 mm in height and 152 mm in width											
Maximum size of entrance (mm)	152	152	152	152	152	na	152	na	152	na		

Lobster fishing vessels vary in overall length from approximately 38 ft. to 44 ft. with a maximum length of 45 ft. The same vessel is used at various times during the fishing season to harvest other commercial species such as herring, rock crab, snow crab, and mackerel. Crew size also varies but most vessels carry 1 or 2 helpers in addition to the licence holder/owner.

Trap dimension and design have changed and evolved through time and the arrival of hydraulic haulers on fishing vessels has allowed the use of larger traps. However, the majority of traps currently in use are still under the maximum allowable dimensions (Table 10). Building material (wood, metal, or combination of both) and trap configuration (rectangular or bow) have changed over time as well as the number of entrances and parlors, and the offsetting and inclination of entrances.

Since 1996, traps must be equipped with escape vents that serve to reduce the retention of undersized lobster and non-target species. The height of the escape mechanisms needs to be adjusted according to carapace size in effect in each LFA (see below).

Length of escape opening between 127 mm and less than 254 mm	
Minimum carapace size	Height of escape opening
70 mm to 71 mm	40 mm
>71 mm to 73 mm	42 mm
>73 mm to 76 mm	43 mm
>76 mm to 81 mm	44 mm
>81 mm to 82 mm	46 mm
>82 mm to 83 mm	47 mm
Length of escape opening equal to or greater than 254 mm	
Minimum carapace size	Height of escape opening
70 mm to 71 mm	40 mm
>71 mm to 73 mm	41 mm
>73 mm to 76 mm	42 mm
>76 mm to 80 mm	43 mm
>80 mm	44 mm

A biodegradable panel conservation measure was implemented in 1995 and modified in 2012. The modified biodegradable mechanism consists of a portion of the trap wall that can detach or decompose. Only untreated cotton twine with a diameter < 1.5 mm can now be used as a biodegradable mechanism. The modified biodegradable panel in the parlor section of the trap became mandatory in 2013 for all LFAs in the SGSL (DFO 2013a).

4.2.6.2. Eastern Scotian Shelf (UoC 2)

Table 11. Characteristics of the lobster fleet and traps limits in the East Scotian Shelf as of 2010. Source: DFO 2011b and Tremblay et al 2011.

	LFAs							
	27	28	29	30	31A	31B	32	33
Licence type A	464	8	52	20	67	70	143	532
Licence type B	10	1	9		4	1	8	50
Partnership A	26				2		4	111
Communal A	11	7	6				6	12
Partnership Communal	4							2
Total	524	16	67	20	73	71	161	707
Number of traps per licence-A	275	250	250	250	250	250	250	250
Other		Max. hoop size 153 mm	Max. hoop size 153 mm					

The fishery is prosecuted by vessels less than 45 ft. In LFA 33, the maximum vessel length is restricted to 45ft with authorized maximum stern extension of 5 ft. All other Maritimes Region LFAs can utilize vessels up to 65 ft, however, few if any, exceed 45 ft (Tremblay et al 2011). Crew size also varies but most vessels carry 1 or 2 helpers in addition to the licence holder/owner.

Trap dimension and design have changed and evolved through time and the arrival of hydraulic haulers on fishing vessels has allowed the use of larger traps. Building material (wood, metal, or combination of both) and trap configuration (rectangular or bow) have changed over time as well as the number of entrances and parlors, and the offsetting and inclination of entrances.

Traps must be equipped with escape vents that serve to reduce the retention of undersized lobster and non-target species and a biodegradable trap mechanism to mitigate ghost fishing by lost traps.

4.2.6.3. Southwestern Scotian Shelf (UoC 3)

Table 12. Characteristics of the lobster fleet and traps limits in the Southwestern Scotian Shelf as of January 2013. Source: DFO 2013d and Tremblay et al 2011.

Licence type A	860
Licence type B	0
Partnership A	90
Communal A	27
Partnership Communal	2
Total	979
Number of traps per licence-A	375: 1 st day of season – March 31 400: April 1 – May 31
Number of traps per Partnership A	563: 1 st day of season – March 31 600: April 1 – May 31

In LFA 34, the maximum vessel length is restricted to 45ft with authorized maximum stern extension of 5 ft (Tremblay et al 2011). Crew size also varies but most vessels carry 1 or 2 helpers in addition to the licence holder/owner.

Trap dimension and design have changed and evolved through time and the arrival of hydraulic haulers on fishing vessels has allowed the use of larger traps. Building material (wood, metal, or combination of both) and trap configuration (rectangular or bow) have changed over time as well as the number of entrances and parlors, and the offsetting and inclination of entrances.

Traps must be equipped with escape vents that serve to reduce the retention of undersized lobster and non-target species and a biodegradable trap mechanism to mitigate ghost fishing by lost traps.

4.2.6.4. Bay of Fundy (UoC 4)

Table 13. Characteristics of the lobster fleet and traps limits in the Bay of Fundy as of January 2013. Source: DFO 2013e and Tremblay et al 2011.

	LFA 35	LFA 36	LFA 38
Licence type A	75	135	65
Licence type B	3	1	1
Partnership A	2	26	54
Communal A	13	13	12
Partnership Communal	2	2	4
Total	95	177	136
Number of trap per licence-A (Licence B)	300 (90)	300 (90)	375 (113)

Harvesters can utilize vessels up tp 65 ft, however, few if any, exceed 45 ft (Tremblay et al 2011). Crew size also varies but most vessels carry 1 or 2 helpers in addition to the licence holder/owner.

Trap dimension and design have changed and evolved through time and the arrival of hydraulic haulers on fishing vessels has allowed the use of larger traps. Building material (wood, metal, or combination of both) and trap configuration (rectangular or bow) have changed over time as well as the number of entrances and parlors, and the offsetting and inclination of entrances.

Traps must be equipped with escape vents that serve to reduce the retention of undersized lobster and non-target species and a biodegradable trap mechanism to mitigate ghost fishing by lost traps.

4.2.7. Market information

The lobster fishery is the major source of income for New Brunswick and Nova Scotia fishers. NS and NB fishers catch approximately 55% and 18% of the annual Canadian landings of lobster.

Canada and the United States are the only countries that harvest American lobster with Canada having the highest landings.

In terms of lobster export, the United States is primary market for Canadian lobster, followed by Europe (primarily Belgium, France and United Kingdom) and Asia. Canadian lobster is sold in different forms, but the main product traded on the U.S markets are live lobster, lobster tails and meat. With more than 80% of Canadian lobster exports destined for the United States, U.S. market conditions have a significant impact on the Canadian lobster industry.

4.3. Principle One: Target Species Background

Despite the amount of scientific information available for all UoCs, the team decided to assess those fisheries using the Risk Based Framework (RBF) considering the following rationale:

- There is no direct measurement of lobster biomass (empirical or analytical);
- There are no biologically-based reference points defined for the fisheries, reference points are based on landings;
- The status of the lobster stock is assessed using indicators (fishing pressure, abundance, and production) derived from fishery-dependent and fishery-independent data;

It is not currently possible to assess the uncertainty.

4.3.1. Southern Gulf of St Lawrence (UoC 1)

4.3.1.1. Stock assessment (DFO 2013b and DFO 2013 Draft)

There is no direct measurement of lobster biomass (empirical or analytical). The lobster stock assessment is based on the analysis of trends of stock indicators including **abundance**, **fishing pressure** and **production**, derived from fishery-dependent and fishery-independent data.

The fishery-dependent data include:

- DFO official catch statistics
- At-sea sampling activities in LFA 23 (1983-2004, 2012), 25 (1983-present), 26A (1983-present), 26B (1983-2003, 2013)
- Voluntary recruitment-index logbook program (1999-present)

The fishery-independent data consist of:

- A trawl survey conducted in LFA 25 and part of LFA 26A (2001-2009, 2012)
- SCUBA survey indices from LFAs 23, 25 and 26A (2005-2012)
- Bio-collectors (2008-2012)

Since LFAs were not established based on biological characteristics of sub-populations but for management purposes, some encompass portions of different habitats and oceanographic regimes. Assessing the lobster fishery solely based on the existing management boundaries might not reflect adequately the status of the lobster populations and/or the fishery itself (DFO 2008). Therefore for the purpose of the assessment, some LFAs were divided into sub-regions (Figure 17) that reflected availability of data as well as geographic and biological similarities. LFA 24 and 26B were not subdivided. LFA 23 was divided into two areas, LFA 23BC (Baie des Chaleurs) and LFA 23G (Gulf of St Lawrence side). LFA 25 was divided into LFA 25N (northern part) and LFA 25S (southern part, central Northumberland Strait). LFA 26A was divided into LFA 26AD (west of Pictou Island, central Northumberland Strait), LFA 26APEI (eastern side of PEI) and LFA 26ANS (mainland Nova Scotia, east of Pictou Island). NS and NB fishermen fish in 23BC and 23G, 25N and 25S, and in 26AD and 26ANS.

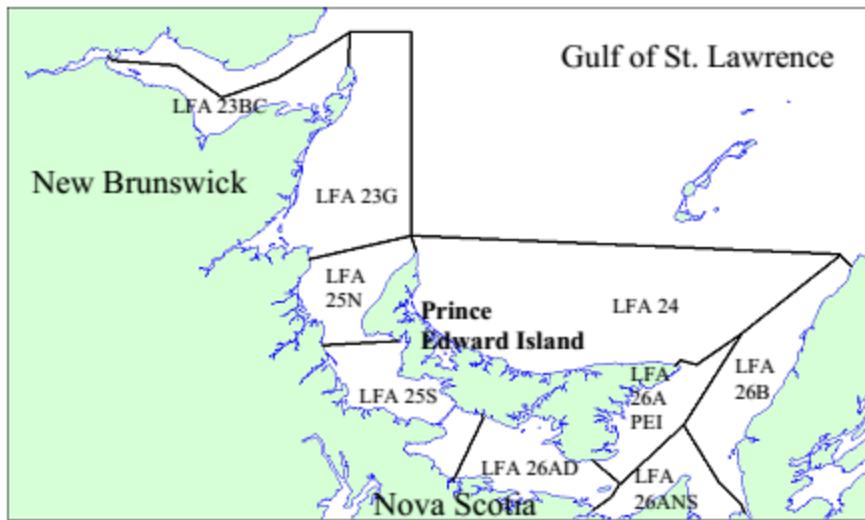


Figure 17. Map of the sub-regions used in the context of the lobster assessment in the SGSL. Source: DFO 2013b.

4.3.1.1.A. Fishery-dependent data

Official statistics

Official lobster catch statistics were obtained from the Policy and Economics Branch of DFO. The database consists of a compilation of sale transactions conducted between official lobster buyers and harvesters. Although this information essentially documents monetary transactions, it is assumed that the volume sold to official lobster buyers closely tracks the quantity of lobster caught by lobster harvesters. Furthermore, because the actual fishing location is not available from this data source, it was decided that landings would be separated by statistical district (sub-regions used for the lobster assessment), and assumed that the statistical district where lobster catches were landed generally represents the geographical area which lobsters were caught.

Lobster Resource Monitoring Program of PEI Department of Fisheries, Aquaculture & Rural Development (LRMP)

The purpose of the LRMP is to provide a sound database for evaluating the structure of the trappable population, including the number and size of egg-bearing females and the abundance of large animals (PEIDFARD and DFO 2012). This program is a partnership between the PEI Department of Fisheries, Aquaculture & Rural Development (DFARD) and DFO. A Memorandum of Understanding presents the contributions and expected outputs of each partner (Table 14). The document, prepared jointly by DFARD and DFO, explains the procedures required to conduct the three components of the LRMP, **at-sea sampling, recruitment-index and bio-collectors programs**.

Table 14. Contributions and outputs of each partner. Source: PEIDFARD and DFO 2012.

Department of Fisheries and Oceans Coastal Invertebrate Fisheries Section	Prince Edward Island Department of Fisheries, Aquaculture & Rural Development
<i>Contributions and outputs</i>	<i>Contributions and outputs</i>
Scientific protocols and sampling form templates (scientific expertise)	Sampling staff, the sampling equipment and cover the cost associated with field expenses
On site training for all samplers	Coordination of the sampling team
Data analyses on sea sampling data collected	Collect the information and compile the data in computerized data files
Scientific permits for samplers and fishers participating in the monitoring with traps	Provide the compiled and verified data files to DFO for analyses
Analyses of the logbook data	Liaison with the fishing industry.
Logbook and sea sampling reports to participating fishers.	
<i>Joint contributions and outputs</i>	
<i>Deliver results to industry by; 1) circulating summaries of the results, 2) providing access to detail reports on request, 3) scheduling public meetings to present the results and receive comments.</i>	
<i>Non sea sampling related activities</i>	
Material and support for lobster tag returns	Collect lobster tagging information when required and forward the information to appropriate fishers.

At-sea sampling program

DFO at-sea sampling program was in place from 1982 to 2003 in all LFAs providing information on lobster size structure, catch rate, and empty trap. The program went through numerous changes over the years (Mallet et al 2006). The sampling was conducted by scientific staff onboard commercial fishing vessels during the fishing season. One sea sample was defined as one day at-sea with one harvester from a given port. Ports selected were chosen because of their geographical position and the interest shown by the fishing community. Sampling personnel onboard the vessel recorded information on lobster size (CL to the lowest mm), sex and condition (egg stage of berried females), in addition to trap types and characteristics (DFO 2008). Other information recorded include the trap position on the line of trap (where available), precise geographic position of the line of traps using a GPS, water depth and species used as bait.

Following the termination of the program by DFO, the PEI provincial government decided to initiate their own program using the same protocol for lobster harvesting out of their province (i.e. LFAs 24, 25 and 26A). Thus, continuous information from at-sea sampling program between 2004 and 2012 around PEI was available for analysis. For NB and NS, at sea-sampling programs were only carried out during 2012 fishing season (Table 15). Data collected by the DFARD staff, trained by DFO technicians, are archived by DFO and shared. At-sea sampling activities for 2010 to 2012 are described in Table 15.

At-sea sampling is conducted on a three time per season basis (start, middle, and end). For LFA 25, only at-sea sampling data collected in August were used for the assessment since almost 60% of all catches occur in the first 3 weeks of the fishery. For all other LFAs, at-sea sampling data for the entire fishing season were used.

Table 15. At-sea sampling activities description per sub-regions: number of berried female (B), male and non-berried female (M&F) lobsters measured, ports visited, number of samples and traps sampled. Source: DFO 2013 Draft.

	LFA 23BC					LFA 23G				
	B	M&F	Port	Samples	Traps	B	M&F	Port	Samples	Traps
2012	3751	23948	3	26	7549	2265	19856	3	26	7750

	LFA 25N					LFA 25S				
	B	M&F	Port	Samples	Traps	B	M&F	Port	Samples	Traps
2010	377	2308	2	3	633	257	1371	2	2	367
2011	677	5781	3	6	1328	195	1238	2	2	375
2012	783	7233	4	6	116	4	5932	4	8	1878

	LFA 26ANS					LFA 26AD				
	B	M&F	Port	Samples	Traps	B	M&F	Port	Samples	Traps
2010	-	-	-	-	-	1084	2436	4	12	3199
2011	-	-	-	-	-	409	1398	3	9	1888
2012	3132	9681	3	20	5015	1138	3930	5	24	5465

	LFA 26B				
	B	M&F	Port	Samples	Traps
2012	2827	16148	6	32	7609

Using both the number of licences issued and the number of fishing days in the fishing season, it is possible to calculate the theoretical maximum number of fishing trips (number of licences x number of fishing days) for each LFA. Based on this and the number of samples provided in Table 15, the Assessment Team has determined that the 2012 at-sea sampling activities covered approximately 0.12%, 0.05%, 0.12 %, and 0.23% of the fishing trips in LFA 23, LFA 25, LFA 26A and 26B, respectively.

Recruitment-index program

The recruitment-index program is a harvester-based at-sea sampling that collects information on lobster size and CPUE throughout the fishing season. It contrasts with the at-sea sampling described above that is more intensive (i.e., precise measurements with a calliper of all lobster caught in traps), but for only a few days within the fishing season.

This experimental trap program was put in place in 1999 to monitor the relative abundance of pre-recruits and its relative CPUE (DFO 2008). In addition to filling a daily logbook of their catch and number of traps hauled, harvesters participating in this voluntary program recorded using the experimental trap logbook the size and sex of all lobsters caught in 6 identified traps, 3 of which had the escape vent blocked. The 6 traps are placed alternately (i.e. modified, not modified...) on the same traps line. It was thought that traps not equipped with an escape vent would retain more lobsters below the MLS. The lobster CL was measured with a gauge graduated in 13 size classes (Figure 18). Class size 1 represented lobsters at least 20 mm smaller than the MLS and class size 13 referred to lobsters 50 mm above the MLS. Except for size classes 2, 11 and 12, which are 10-mm group size, all other size classes are 5-mm groupings. Lobster of group size 4 and below were sub-legal lobsters whereas group sizes 5 and 6 always represented animals from the first moulting group into the fishery because the gauge was adjusted to the proper MLS for a given area.

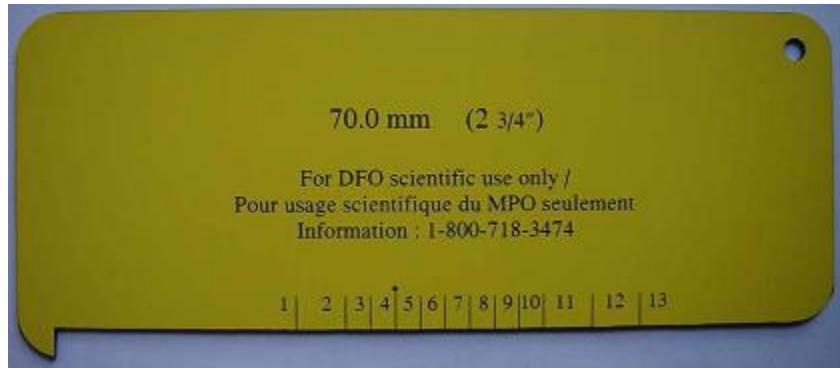


Figure 18. Gauge used by harvesters participating in the recruitment-index program. Source: DFO 2013 Draft.

Between 2007 and 2011, only LFAS around PEI were covered as the program has been maintained by the PEI provincial government following the termination of the program managed by DFO. In 2012, harvesters groups from LFAs 26A and 26B participated in the recruitment-index program and shared the data with DFO-Science for this assessment.

Table 16 summarizes sampling activities within the recruitment-index program in the different sub-regions.

Table 16. Details of the sampling activities within the recruitment-index program, 2009 to 2011, in the different sub-regions. Data from 2012 were not available for 25N, 25S, and 26AD but activities were conducted. Source: DFO 2013 Draft.

Sub-region	Year	Number of participants	Lobster measured Modified	Modified traps sampled	Lobster measured Regular	Regular traps sampled	Total Lobsters
25N	2009	10	10569	1247	4617	1247	15186
	2010	13	15443	1657	7699	1656	23142
	2011	13	14605	1574	7172	1574	21777
25S	2009	3	1172	360	972	360	2144
	2010	3	1293	340	1062	340	2355
	2011	3	1549	360	1240	360	2789
26AD	2009	7	1204	875	1191	876	2395
	2010	7	1237	864	1146	863	2383
	2011	7	1012	897	960	898	1972
26ANS	2012	8	3053	1122	2498	1122	5551
26B	2012	5	2915	645	1893	641	4808

4.3.1.1.B Fishery-independent data

Trawl survey in LFAs 25 and 26A

Trawl surveys were conducted in 2001 to 2009 and 2012. The trawl survey was initially designed to detect between-year differences in abundance and distribution of commercial size-classes of lobster in LFA 25 but has been expanded over the years to cover most of LFA 26A as well (DFO 2008). The survey used a random-block experimental design where the blocks initially were of similar size and were based on differences in substrate particle size with an overlaying grid of 2 x 2 nautical miles. Primary and alternate stations were randomly selected within each block. The survey net was a number 286 bottom trawl equipped with rubber “rock-hopper” footgear that has been used to sample demersal fishes and large crustaceans in the survey area since 1990 (DFO 2013 Draft). Based on previous monitoring of the net opening (wing width) with ultra-sonic sensors (SCANMAR), an average wing width (95% CI) of 9.0 ± 0.2 m ($n=149$) was used to calculate densities (number per ha or per km^2).

The catch was sorted to species, each weighed and numbers recorded. For all lobster, CL (to the lowest mm) and sex were recorded, as well as the presence of eggs for berried females. A complete description of the survey design can be found in DFO (2008).

The sampling intensity in terms of number of stations (~235) and protocol was quite similar between 2006 and 2009, but changed in 2010 and 2011. In those 2 years, a Bigouden trawl with a smaller footgear and a different fishing protocol was used. The number of stations was also reduced to about 110. In 2012, the original survey design and trawl (bottom trawl with “rock-hopper” footgear) were used, but the number of station was kept at 110 (Figure 12). The geographical coverage of the trawl survey was gradually increase in 2008-2009 to include the eastern portion of LFA 26A that was not covered before. Given different lobster catchability between the 2 trawl types, data from 2010 and 2011 were not used in the last stock assessment.

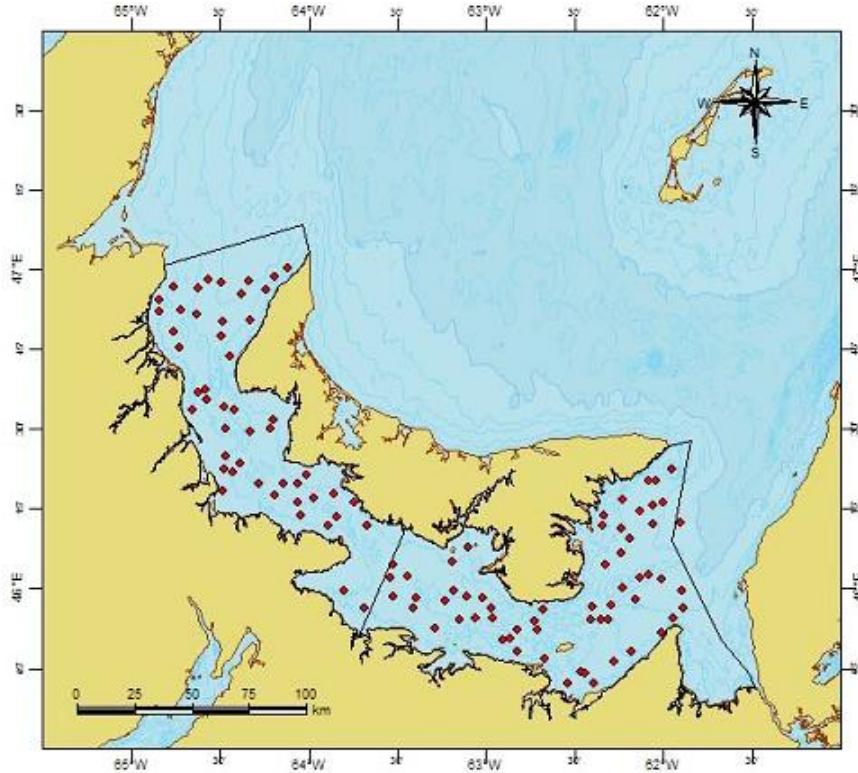


Figure 19. Map of stations sampled in 2012 during the trawl survey in LFA 25 and 26A. Source: DFO 2013 Draft.

SCUBA survey in LFAs 23, 25 and 26A

To assess the lobster abundance, visual line-transect surveys were done by SCUBA divers on lobster habitat between 2005 and 2012 at various sites in LFAs 25 and 26A (Table 17). A 100-m transect line marked at 5-m intervals is used to survey all of the sites. Transects are randomly placed on the site to be sampled and surveyed by two divers, one each side of the line.

Table 17. Number of line transects done at various sites in LFA 25 and 26A, 2005 to 2012. Source: DFO 2013 Draft.

Site	LFA	Years							
		2005	2006	2007	2008	2009	2010	2011	2012
Pointe-Verte	23BC					6	11	11	6
Grande-Anse	23BC	16		13			11		
Caraquet	23G	34	35	27	32	17	27	28	3
Neguac	23G		3	4		1	4		4
Richibucto	25N				8	9		7	6
Cognac	25N				10	7	12	12	12
Shediac	25S	3	5	7	11	11	11	11	11
Robichaud	25S			12	13				
Fox Harbour	26A	43	24	19			12		5
Pictou	26A					3	6		3

Each diver samples an area of 2 m wide perpendicular to the transect line along its entire length for a total swept area of 400 m². Divers attempted to capture every lobster observed within the transect zone. All encountered lobsters were measured and the sex was determined. Other informations such as benthic habitat, other species and habitat complexity were noted. SCUBA data were analyzed to derive both abundance and production indicators.

Bio-collectors program

Passive, vessel-deployed bio-collectors are used as a tool for assessing patterns of post-larval settlement of lobster (DFO 2013Draft). These bio-collectors, with a surface area of 0.55 m² and a weight of approximately 80 kg, were made with 10-gauge vinyl-coated wire filled with rocks to mimic lobster habitat. The inside of the bio-collectors was lined with 2-mm rugged plastic mesh to retain lobster, crabs and other small organisms during retrieval. The inside bottom of bio-collectors was filled with gravel and then cobble locally acquired. Each collector was fitted with a bridle (Figure 20) to permit lifting in a horizontal position, which is important to retaining collections during retrieval.



Figure 20. Bio-collectors being deployed. Source: DFARD

In 2008, the bio-collectors project was carried out by DFO at 6 sites: Arisaig (26ANS), Bedeque (25S), Caraquet (23BC), Covehead (24), Neguac (23G), and Shediac (25S).

Since 2009, six sites are followed (Figure 14). At each site, 30 bio-collectors were deployed by boat at depths ranging between 5 to 7 m (9 m in Neguac) in late-May and early-June. Divers were sent down to verify the positioning on appropriate lobster habitat of each bio-collector on the seafloor. The retrieval occurred in October-November.

In collaboration with PEIFA, 6 sites were done between 2009 and 2012, with an additional site in Arisaig (NS).

After retrieval at the end of the submersion period, the wire mesh covers were removed from the bio-collectors once on deck, and rocks were rinsed and removed to inspect for lobsters. All lobsters were measured and their sex was determined.

4.3.1.1.C. Determination of indicators

The lobster stock assessment is based on the analysis of trends of stock indicators including **abundance**, **fishing pressure** and **production** derived from fishery-dependent and fishery-independent data (Table 18).

Table 18. List of indicators compiled for each LFA.

Indicators	LFA 23	LFA 25	LFA 26A	LFA 26B
Abundance				
Landings	✓	✓	✓	✓
65 yrs long median vs. present	✓	✓	✓	✓
44 yrs median vs. present	✓	✓	✓	✓
2005-2011 short median vs. present	✓	✓	✓	✓
CPUE – At-sea sampling and recruitment-index programs	✓	✓	✓	✓
Abundance - SCUBA survey	✓	✓	✓	
Densities spatial analysis and length-frequency distribution – Trawl survey		✓	✓	
Length-frequency distribution – At-sea sampling program	✓	✓	✓	✓
Fishing Pressure				
Exploitation rate				
Empty traps	✓	✓(25N)	✓	✓
Nominal effort - Based on number of licences and traps	✓	✓	✓	✓
Production				
Berried females in the catch – At-sea sampling	✓	✓	✓	✓
Pre-recruit CPUE – Recruitment-index program		✓	✓	✓
Pre-recruit density – Trawl survey		✓	✓	
Sex ratio – Trawl survey		✓	✓	
One-year old and berried female abundance – SCUBA survey	✓	✓	✓	
Settlement index – Bio-collectors	✓	✓	✓	

Abundance

Landings

The 2011 preliminary (2011p) landings have been compared to the median landings of the long- (65 years), mid- (1968-2011), ad short (2005-2011) term trends. Landing indicators were defined as followed: if the 2011p landings were within $\pm 15\%$ of the median landings, then they were not different (i.e., stable ); if the 2011p landings were higher than 15% or lower than 15%, it indicates that they were higher () or lower () respectively. Another indicator is used to assess annual landing trends within a specified ranking system. Based on an ascending ranking approach, landings were ranked compared to the 1968-2011p median landing for each statistical district. For this indicators, landings were ranked as 1 for values greater than 75%, 2 for values ranging between 26% and 75%, 3 for values ranging between -25% and 25% (values within the median value), 4 for values ranging between -26% and -75%, and 5 for values lower than -75%.

CPUE – At sea-sampling and recruitment-index programs

Data collected through the at-sea sampling program are divided into two sex groups: 1) berried female lobsters, and 2) male and non-berried female lobsters. Berried females were treated separately in the analysis as they could be above the MLS but are not retained by the commercial fishery.

Size distribution and CPUE at size were based on 2-mm size groups:

$$CPUE_{id} = \frac{\text{total number of lobsters in size class } i \text{ and zone } d}{\text{Number of traps sampled in zone } d}$$

Average CPUE in kg/trap by year are calculated using length-weight relationships applied to the observed length-frequency data and divided by the total number of traps sampled.

Average CPUE of male and non-berried female were also calculated from the recruitment-index program but in number per trap. Only data from regular traps were used.

Densities spatial analysis and length-frequency distribution - Trawl survey

Interpolated densities over the survey area were produced using a delta-lognormal model. Catch data were portioned into a presence-absence component and a non-zero catch component. A logistic-regression model, applied to the presence-absence data, estimated the probability of observing a non-zero catch while a log-normal regression model, estimated the quantity which was observed. Additive smoothing terms based on water depth plus spatial term were included for both model components. Coordinate data for the spatial term were transformed in km (via a UTM projection).

Two size-classes were analysed separately: sub-legal lobster (<MLS) and commercial lobster (\geq MLS). Catch weights (kg) were calculated using length-weight relationship applied to the observed length-frequency data. There were standardized to a tow length of 0.625 nm. For each year, the proportion of estimated densities over 400 kg per km^2 within LFA 25 were calculated. Mean length-frequency by years were calculated for LFA 25 and LFA 26A, grouped by 3 mm size intervals.

Length-frequency distribution – At-sea sampling program

During at-sea sampling activities, sampling personnel onboard the vessel recorded information on lobster size (CL to the lowest mm).

Length-frequency distribution of combined male and female lobsters was done for each LFA for 2000, 2012, and a 2000 vs 2012.

Lobster abundance – SCUBA survey

For each transect, counts of observed lobster by cohort, using size intervals, were tabulated and analysed. The applied model is a type of GLMM, which assumes that observed counts are realizations from a Poisson whose conditional mean is defined by an underlying 3-factors (i.e., year, site and cohort) additive model with 2-way interactions on the log-scale. The hierarchical structure of the model provided a relatively simple way of pooling information between years and sites. Interaction terms allow for variation between temporal, spatial and cohort trends to be incorporated in the model. This combination of hierarchical pooling and model flexibility allows making reasonable inferences on missing data observations, all while taking uncertainties into account.

Fishing pressure

Exploitation rates

Two different estimators were used to calculate the exploitation rate based on at-sea sampling and recruitment-index male data. Data from males were used to avoid the bias related to the female's

reproductive cycle, i.e., females have a 2-year reproductive cycle alternating from molting to spawning while males molt on a yearly basis at sizes close to the MLS.

The first estimator is based on Miller et al. (1987) method by comparing the abundance of the first molt class recruited to the fishery to the second molt class a year later (designated as the molt class method). The second estimator used was the “change-in-ratio” (CIR). This method has already been used for lobster and other crustaceans (Chen and Montgomery 1999, Gendron and Savard 2003, Tremblay et al. 2012), and basically monitors the change in abundance ratio of commercial and sub-legal size lobsters between the beginning and the end of a fishing season. Only data from the modified traps of the recruitment-index program were used in order to have a good representation of sub-legal animals. Commercial sizes were limited from the MLS to, but not including MLS+20 mm, i.e., about 2 molt classes. The sub-legal lobsters considered were from MLS-10 MM to, but not including MLS. Classes were adjusted to MLS changes accordingly.

The usual underlying assumptions for that kind of estimators are: (1) the population is closed, (2) the catchability of all size classes considered is equal, (3) the ratio of catchability by monitored traps and commercial traps is constant over the season, and (4) the fishing effort is either constant over the season or can be estimated up to a constant factor.

Empty traps

An indicator of fishing pressure can be derived from the percentage of empty traps seen during commercial activities. Traps were being considered “empty” when no commercial lobsters, i.e., lobster smaller than the MLS, berried females, and window/maximum size females were caught. Yearly data from the at-sea sampling and the recruitment-index program (regular traps only) were used for each sub-region, and the number of empty traps was divided by the total number of traps sampled. However, data from the recruitment-index program were slightly biased because window/maximum size females could not be eliminated. For example, traps with only window-size/maximum size females would not be considered “empty” although it is prohibited to land these females. That situation would most likely decrease the percentage of empty traps.

Nominal effort

The number of licences allocated per LFA and the maximum trap allocation are used as an indicator of the nominal effort.

Production

Berried females in catch – At-sea sampling

At-sea sampling data were analysed to provide an abundance indicator of berried females in the catch. When the data series from the last assessment (2006) was not continuous, the last year of data was kept for comparison with the 2012 data.

Pre-recruit CPUE – Recruitment-index program

For the analyses, yearly information collected in the 6 traps was grouped according to the sub-regions and trap types (regular or modified with the escape vent blocked). The number of lobsters (excluding berried females) per trap at-size ($CPUE_n$) was calculated using the gauge’s bin sizes and the equation for CPUE.

Pre-recruit density and sex ratio – Trawl survey

Contours of sub-legal lobsters distribution in Northumberland Strait and area of abundance > 400kg of sub-legal lobsters per km² were calculated. Yearly sex ratio between males and non-berried females of legal and sub-legal sizes were calculated by LFAs and adjusted to the MLS. For LFA 26A, the MLS used was the one for the management zone 26A1. Pearson's Chi-squared test was applied to the data by LFA and size group to identify sex ratio differences between years.

Lobster settlement index – SCUBA and bio-collectors

Production indicators were derived from data collected from SCUBA surveys and bio-collectors. For the recruitment to the benthic habitat index based on SCUBA data, standardized mean number of lobsters derived from the model and empirical data were used for the old-year old benthic animals from various sites. For the lobster settlement index, observed young-Of-year (yoY) lobster counts per bio-collectors were modelled as a Poisson distribution and estimated means confidence intervals (at 95% coverage) were calculated by site and year. Means were scaled to a standard surface area of one square meter. YoY lobsters were identified on a yearly basis from size frequency distributions and instar information from Gendron and Sainte-Marie (2006). YoY were lobsters < 17 mm CL in 2008, 2010-11, and < 15 mm CL in 2009 and 2012.

4.3.1.2 Stock status (DFO 2013b and DFO 2013h)

Abundance

Abundance indicators based on landings for legal size lobster from all LFA are above the long-term (1947 to 2011) median value (Table 19). No decrease in the mid-term (1968 to 2011) or short-term (2005 to 2011) abundance indicators are noted in any LFA. Landings trends have improved since 2005. Landings trends within LFA 26A varied with location, with sub-region 26AD having the weakest trend.

Table 19. Summary of abundance indicators used to assess the changes in status of lobster by LFA and overall for the Gulf of St. Lawrence. ↑ positive; ⇔ indicates that there is no change; ↓ negative.

Indicator	Gulf	23		24	25		26A			26B
		23BC	23G		25N	25S	26AD	26APEI	26ANS	
2011 landings relative to										
Median 1947 to 2011		↑	↑	↑	↑	↑	↑	↑	↑	↑
Median 1968 to 2011		↑	↑	↑	↑	↔	↔	↑	↑	↔
Median 2005 to 2011		↑	↑	↑	↔	↑	↑	↔	↔	↔
Catch per unit effort		↑	↑	↑	↔	↑	↑	↔	↔	↑
Density – trawl survey 2012					↑	↑	↔			
SCUBA surveys			↑	↑	↑	↔	↓			

Trends in average CPUE (number of male and non-berried female lobsters per trap haul) from at-sea sampling and recruitment-index programs are similar with increasing values in most sub-regions (Table 19, Figure 21 and 22). No increase in CPUE was seen in LFAs 26AD and ANS. The highest increase in CPUE was observed in sub-regions 25N and 25S with up to a 5-fold increase in 2012 compared to 2006 (Figure 21 and 22). In sub-regions 23BC, 23G (Figure 21) and 26B (Figure 22), an increase of the 2012 CPUE by 2 to 3-fold was observed compared with values observed in 2003 or 2004. The lowest CPUE (2011-2012) values both in number and in kg per trap were seen in sub-region 26AD.

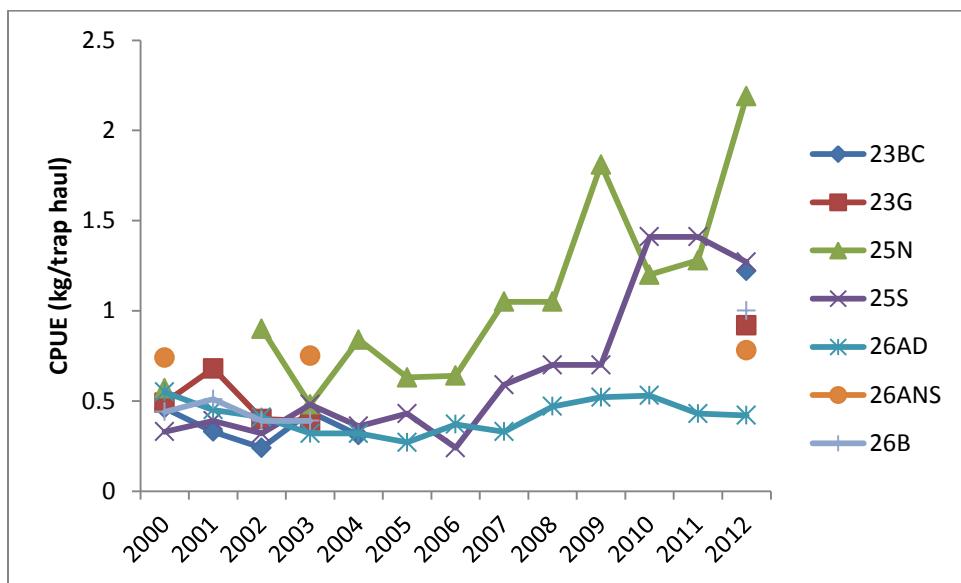


Figure 21. Average CPUE (kg/per trap haul) of male and non-berried female lobster from at-sea recruitment program between 2000 and 2012. For sub-regions 25N and 25S, data are from August only. Source: drawn from Table 12 in DFO 2013h.

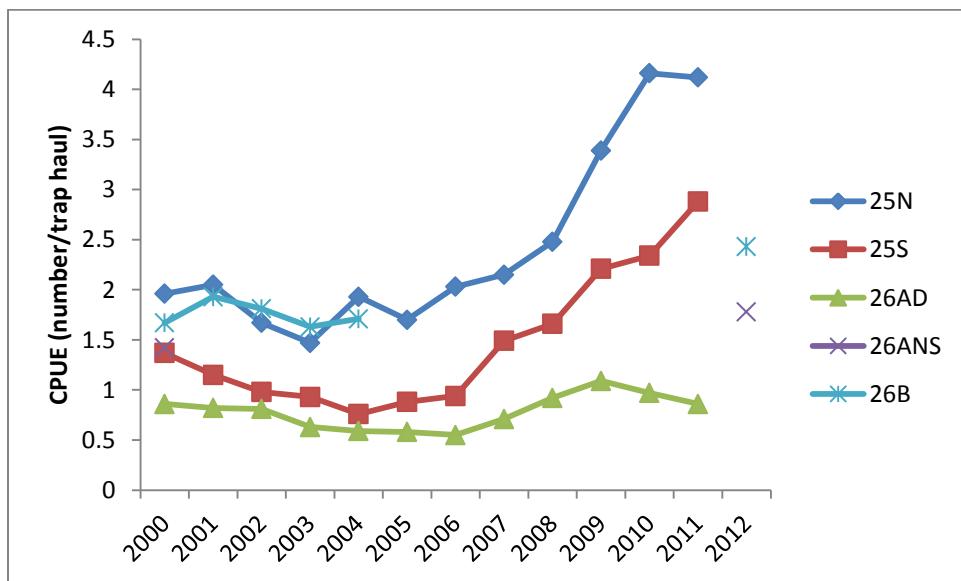


Figure 22. Average CPUE (number/per trap haul) of male and non-berried female lobsters from the recruitment-index program between 2000 and 2012 (regular traps). Source: drawn from Table 13 in DFO 2013h.

Similar positive trends in abundance were observed in the trawl survey (Table 19). Legal size lobsters were concentrated along the east coast of NB, from Shediac up to Escuminac, the west coast of PEI, and around Pictou Island in NS (Figure 23). Lobsters were at very low abundance in the area east of Cape Tormentine to river John (sub-region 26AD). In 2012, the proportion of high density areas ($> 400 \text{ kg of legal-size lobster per km}^2$), the density index, and the biomass indices (observed and from model) were

the highest of the survey time series (2001-2009, 2012) for LFA 25 as a whole. In 2012, both sub-regions within LFA 25 had a biomass index for all sizes lobster above the time series average (Figure 24). For the sub-region 26AD, the 2012 biomass index was also above the time series average (2005-2009, 2012) which was shorter because of spatial coverage gaps before 2005.

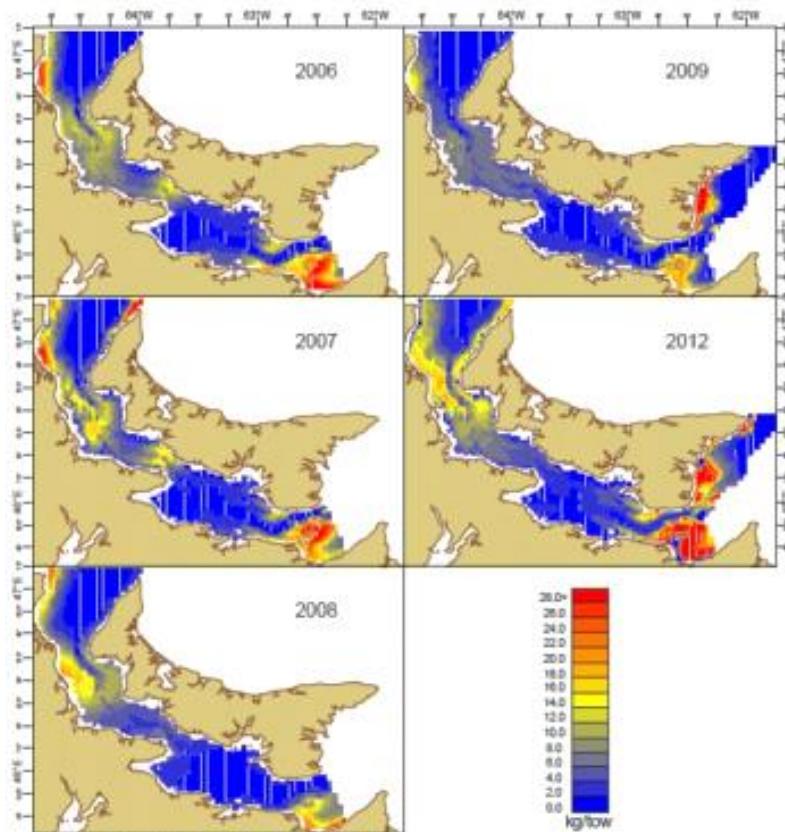


Figure 23. Spatial distribution abundance (kg per tow) of legal-size estimated from the Northumberland Strait bottom trawl survey for 2007 to 2009 (≥ 70 mm CL) and 2012 (≥ 71 mm CL). Source: DFO 2013b.

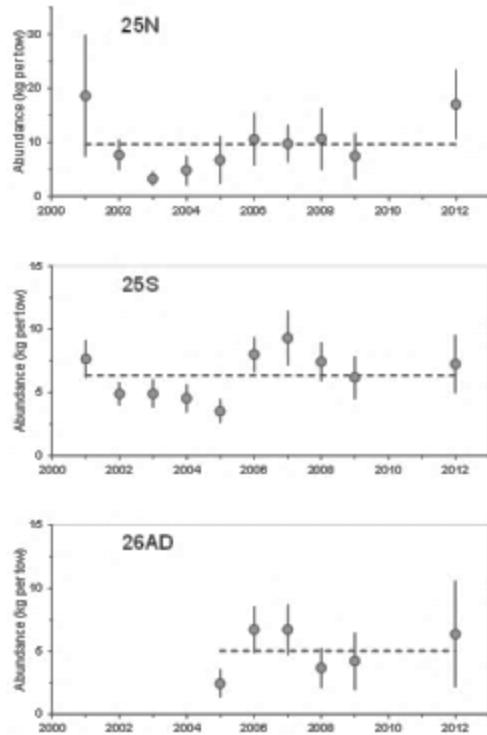


Figure 24. Trends in indicators of abundance (kg per tow, mean and 95% CI) of all sizes of lobster by sub-region from the bottom trawl survey for 2001 to 2009, and 2012. The horizontal lines are the mean values for the time series, 2001 to 2012 except for sub-region 26AD where the mean is calculated for the years 2005 to 2012. Source: DFO 2013b.

Length frequency distribution from trawl surveys revealed an increase abundance of lobsters of all sizes smaller than 80 mm, in 2012, compared to previous years for LFA 25 but not for LFA 26A (Figure 25) where the survey is conducted just after the fishery. No accumulation of large lobsters is observed, despite increased MLS. The fishery always relies on new recruits, and is, therefore, very sensitive to environmental conditions.

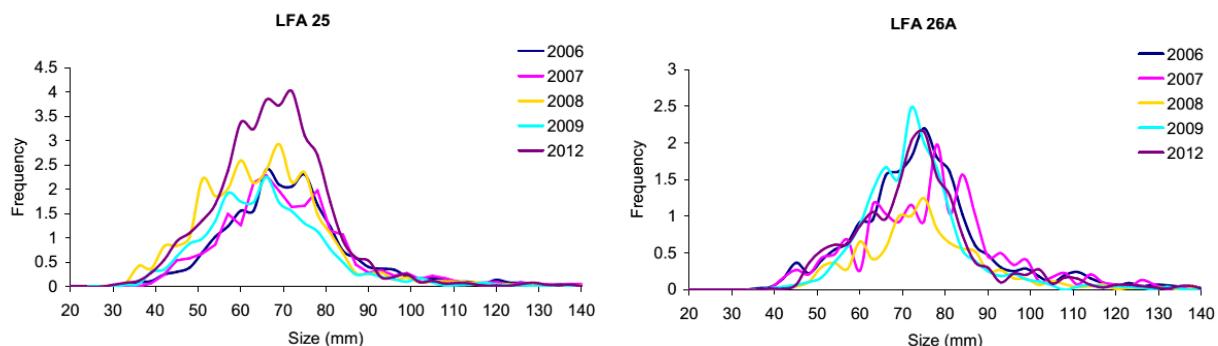


Figure 25. Length distribution of lobster caught during Northumberland Strait trawl surveys in LFA 25 (left panel) and LFA 26A (right panel). Source: DFO 2013h.

Based on a Bayesian estimation model, the standardized abundance of all size groups of lobster observed from SCUBA survey in the SGSL increased steadily and significantly between 2003 and 2012 (Figure 26). The mean abundance increased by more than 6.5-fold, from 2.0 to 13.1 lobsters per 400 m², between 2003 and 2012. Spatially, differences were observed among sites along the north to south axis, but reflected a separation of lobster abundances within and outside central Northumberland Strait. Higher abundances were observed in sub-region 23BC, 23G and 25N, while abundances in sub-regions 25S and 26AD ranged between 0.5 and 5.4 lobster per 400 m² (Figure 27).

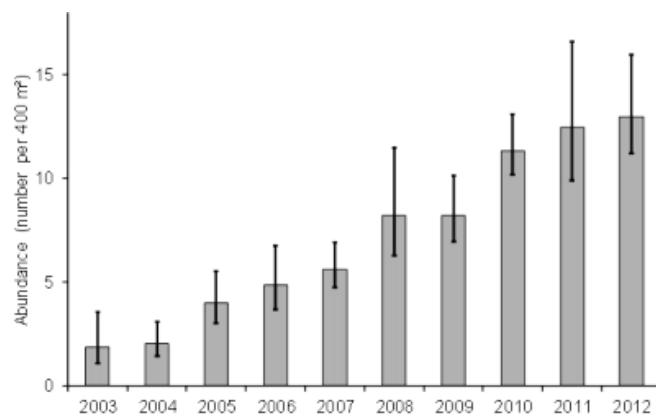


Figure 26. Standardized mean abundance (number of lobsters per 400 m²) for 2003 to 2012, averaged over sites and cohorts from the Bayesian model. Also shown are 95% credibility intervals from the posterior distributions of the model fits. Source: DFO 2013b.

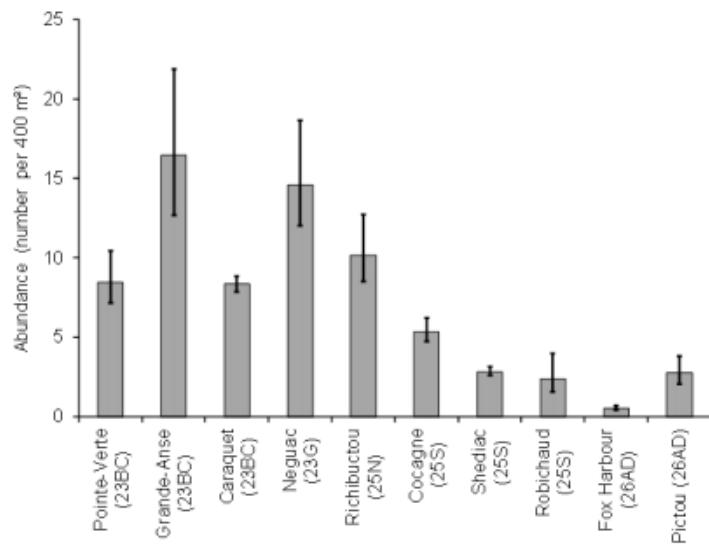


Figure 27. Standardized mean abundance (number of lobsters per 400 m²) by site, averaged over sites and cohorts from the Bayesian model. Also shown are 95% credibility intervals from the posterior distributions of the model fits. Source: DFO 2013b.

Fishing pressure

Exploitation rates by sub-region were estimated using 2 methods, the CIR and a method based on cohorts. A complete series (1999-2011) is produced for LFA 25N, only, which compromises a global picture of the trends, even if we can consider that the pattern would be similar for all LFAs. Over the available periods, estimates of exploitation rates from both methods remain high at over 60% in most regions, with the exception of 25S, with no trend over time (Table 20).

Table 20. Estimates of exploitation rates (%) of commercial-size lobster by sub-region of LFA for years with available data in 1999 to 2011 based on two methods: cohort (COH) and change in ratio (CIR). For the cohort method, the exploitation rate estimate is for the year of the fishery on the first molt class.

Year	23G		25N		25S		26B	
	COH	CIR	COH	CIR	COH	CIR	COH	CIR
1999	33	78	77	65	43		63	63
2000	68	55	65	73	51		63	81
2001	64	78	58	49	58		58	46
2002	68	63	68	70	44		74	55
2003	71	50	53	60	43		79	
2004		73	58	52				
2005			58	66				
2006			65	86				
2007			64	59				
2008			54	59				
2009			57	81				
2010			73	78	41			
2011				84				
Mean	61	66	63	68	47		67	61

Proportion of empty traps from the at-sea sampling and the recruitment-index programs is comparable and shows the same trends per sub-region. Empty trap percentages have generally decreased in all LFAs, except for sub-regions 26AD and 26ANS (Table 21). According to the at-sea sampling program, in LFA 25, for both sub-regions, the percentages of empty traps have varied between 2007 and 2012. The highest proportion of empty traps (58%) was observed in sub-region 26AD. Since 2000, the percentage of empty traps in that region has always been high and has not showed notable decrease over the recent years.

According to the recruitment-index program, there was a decrease in proportion of empty traps in the recent years compared to 2000-2006 level (Table 21), except for 26ANS. Sub-regions with the least empty traps in 2011 were 25N and 25S with 21%, and 24% respectively, a decrease compare to the 200-2006 level. Proportion of empty traps has also decreased in recent years in sub-regions 26AD but with some fluctuations.

Table 21. Summary of trends or levels for the fishing pressure indicator used to assess changes since 2006 in the status of the SGSL lobster stock. ↓ positive; ⇔ indicates that there is no change; ⚡ negative.

Indicator	Gulf	23		24	25		26A			26B
		23BC	23G		25N	25S	26AD	26APEI	26ANS	
Empty traps	↓	↓	↓	↓	↓	↓	↔	↓	↔	↓
Nominal effort – licence	↓	↓	↓	↔	↓		↓		↔	↓
Nominal effort - traps	↓	↓	↓	↔	↓		↓		↓	↓

The recent reduction in nominal effort was assessed based on the number of available licences and the total number of traps allocated from 2006 to 2012 for each management area.

The number of licence in the SGSL was reduced by 9.1% between 2006 and 2012, with most of the reduction (7.5%) occurring after 2009 following the announcement of the ALSM program. Licence number reductions were not equal among LFAs, with no Category-A licences retired in 26A-2 and 25 NS-side. As a result, there was no change in the nominal effort of type-A licence for 26ANS (Table 21). The reduction was mainly observed in LFAs 25 and 23. Licence retirements are expected for 2013 in management zone 26A-1.

Nominal effort in terms of the maximum trap allocation per year and region was estimated by multiplying the number of licence by their allocated trap. There was an overall reduction in nominal effort (Table 21) of 12.3% (112,594 traps) from 2006 to 2012 for all LFAs combined but most reduction (10.5%) was observed following the announcement of the ALSM program in 2009.

Management zones 26A-3 and 26B south had their nominal effort for licences A decreased by 37.5% and 23.9%, respectively. In management zone 26A-1, the reduction was 13.8% for NB. In LFA 23, the reduction varied form 2.2% to 15.8% depending of the sub-LFA, while in LFA 25 it was 17.6% for NB. Nominal effort in 26B dropped by 18.5% from 2008 to 2012.

Production

In the last 10 years, the CPUE indices of berried females in the at-sea samples have generally increased or remained stable (Tables 22-23).

Table 22. CPUEs of berried females for two sizes (70 mm, smaller than the current MLS, and 80 mm, above the current MLS) for the years 2003 and 2012. Data are derived from the figures 28-33.

	Year	23BC	23G	25N	25S	26AD	26ANS	26B
70 mm	2003	0,031	0,005	0,025	0,001	0,007	0,018	0,01
	2012	0,04	0,045	0,06	0,08	0,007	0,03	0,05
80 mm	2003	0,01	0,005	0,005	0,01	0,015	0,02	0,02
	2012	0,06	0,025	0,05	0,095	0,015	0,06	0,04

Table 23. Summary of production indicators used to assess the changes in status of lobster by LFA and overall for the SGSL, from the previous assessment (2007). \uparrow positive; \leftrightarrow indicates that there is no change; \ominus negative. Source: DFO 2013h.

Indicator	Gulf	23		24	25		26A			26B
		23BC	23G		25N	25S	26AD	26APEI	26ANS	
Berried females – at sea sampling		\uparrow	\uparrow	\uparrow	\leftrightarrow	\uparrow	\uparrow	\ominus	\uparrow	\uparrow
Pre-recruit CPUE – recruitment index				\leftrightarrow	\uparrow	\uparrow	\ominus	\leftrightarrow	\uparrow	\uparrow
Pre-recruit density – trawl survey					\uparrow	\uparrow	\leftrightarrow	\uparrow	\uparrow	
Sex ratio – trawl survey					\leftrightarrow		\leftrightarrow			
1-year old abundance - SCUBA surveys			\uparrow	\uparrow		\uparrow	\leftrightarrow	\ominus		

Increases observed in 2012 compared to 2003 for sub-region 23BC and 23G were 1.8 and 2.3-fold, respectively, and peaks reached 0.09 and 0.005 berried female per trap (Figure 28).

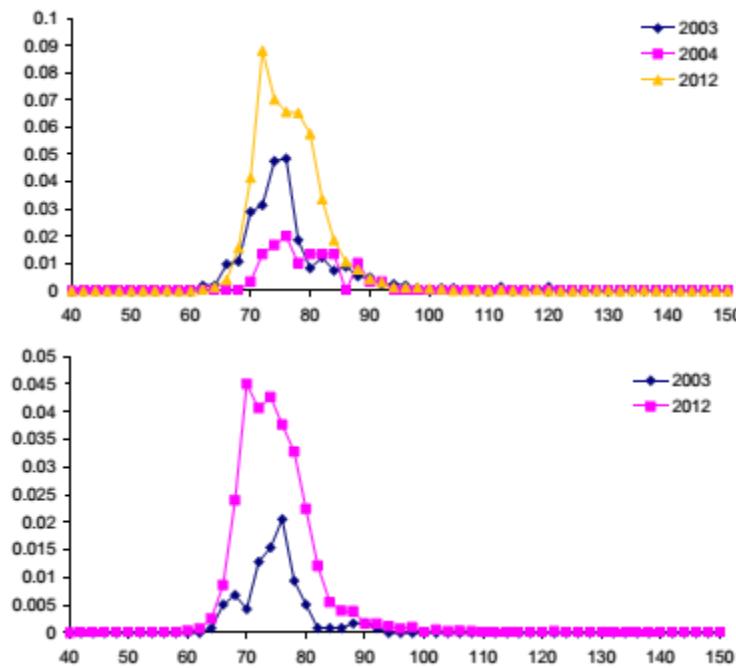


Figure 28. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for sub-regions 23BC (top panel) and 23G (bottom panel). Source: DFO 2013h.

Between 2006 and 2012, peaks for berried females per trap had increase to 2.5 and 5.0-fold in sub-regions 25N and 25S, respectively (Figure 29 and Figure 30) and were the highest among all sub-regions in 2012 with 0.12 berried females per trap in 25S. In 2010, the peak was even higher in 25S, reaching 0.14 berried females per trap (Figure 30).

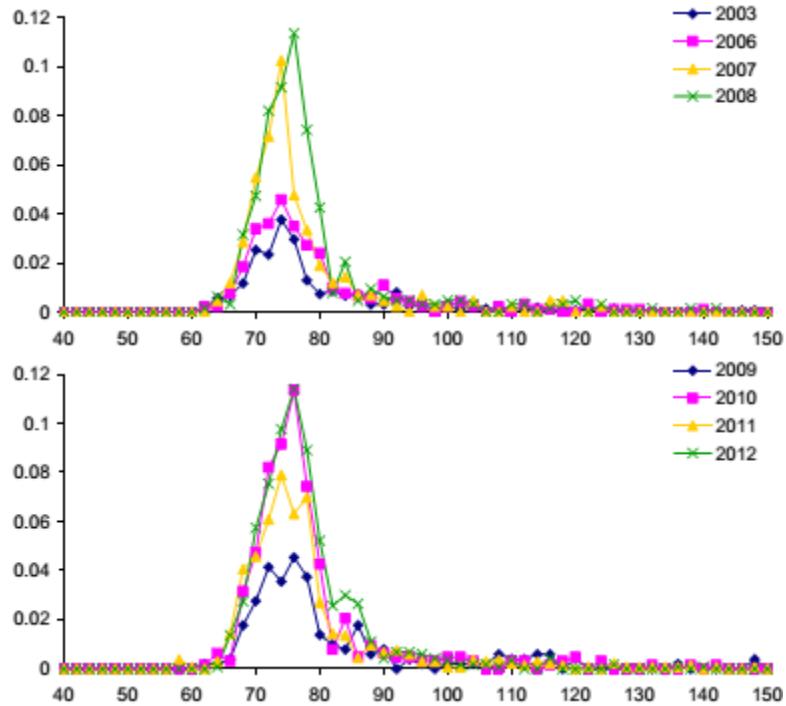


Figure 29. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for LFA 25N. Source: DFO 2013h.

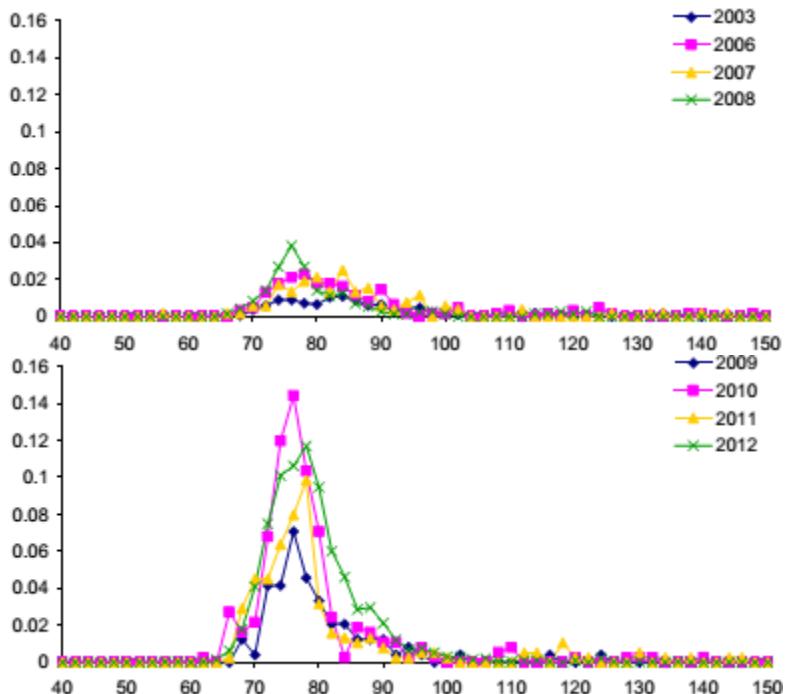


Figure 30. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for LFA 25S. Source: DFO 2013h.

Berried females CPUE in 26AD increased since the last assessment up until 2010 when it reached a maximum at 0.03 berried females per trap (Figure 31). While other sub-regions were showing a narrow size range for berried females, between 65-95 mm CL, in 26AD larger females (> 95 mm CL) were observed in the catch (21% in 2012).

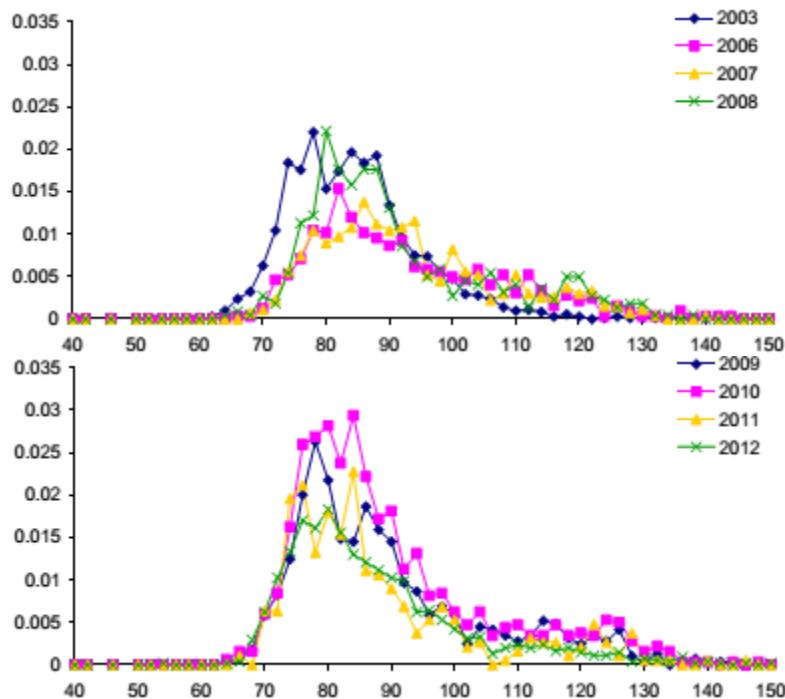


Figure 31. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for LFA 26AD. Source: DFO 2013h.

Increases observed in 2012 compared to 2003 for sub-regions 26ANS and 26B were 2.0 and 1.6-fold, respectively, and peaks reached 0.10 and 0.07 berried female per trap (Figure 32 and Figure 33).

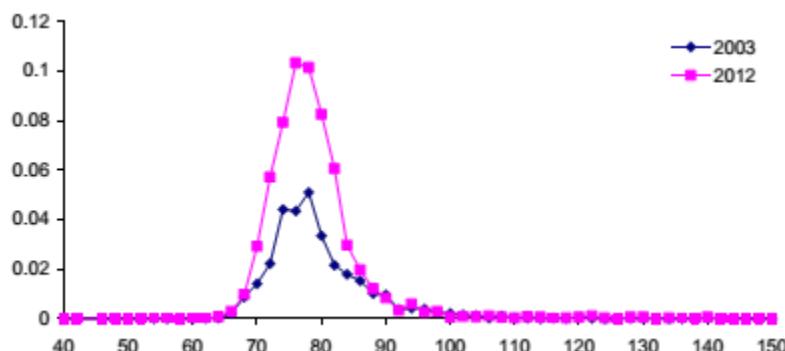


Figure 32. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for LFA 26ANS. Source: DFO 2013h.

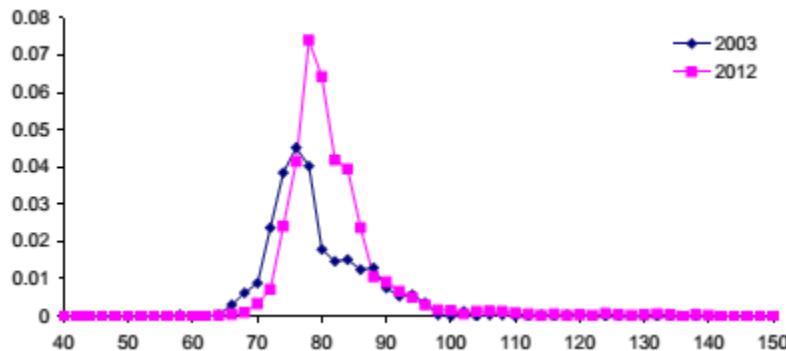


Figure 33. CPUE for berried female lobsters by 2 mm size interval based on data from at-sea sampling program for LFA 26B. Source: DFO 2013h.

The modified traps used in the recruitment-index program provided an index of recruitment size lobsters. The CPUE of fishery recruits have increased in sub-regions 25N, 25S, 26ANS and 26B (Table 23). Sub-region 26AD was characterized by the lowest CPUE of fishery recruits with no difference between data from the modified and regular traps. The absence of a difference between data from the modified and regular traps could indicate very low fishery recruitment in that sub-region. This observation corroborates the low level of recruitment in central Northumberland Strait observed from other fishery dependent and fishery independent indicators.

Concentrations of sub-legal lobsters in trawl survey were detected in the trawl survey along the eastern coast of New Brunswick from 2006 to 2009, and again in 2012 (Figure 34). Also, with the increase coverage of the trawling survey in 2009 and 2012, concentrations of sublegal lobsters have been observed on the east coast of PEI, mainly between Murray Harbour and Souris. In 2006, 2009 and 2012, a concentration was also observed around Pictou Island, and in 2007 and 2012 on the west coast of PEI. No sub-legal lobster concentration was observed for the entire central portion of the Northumberland Strait, from Shedia (NB) to Toney River (NS).

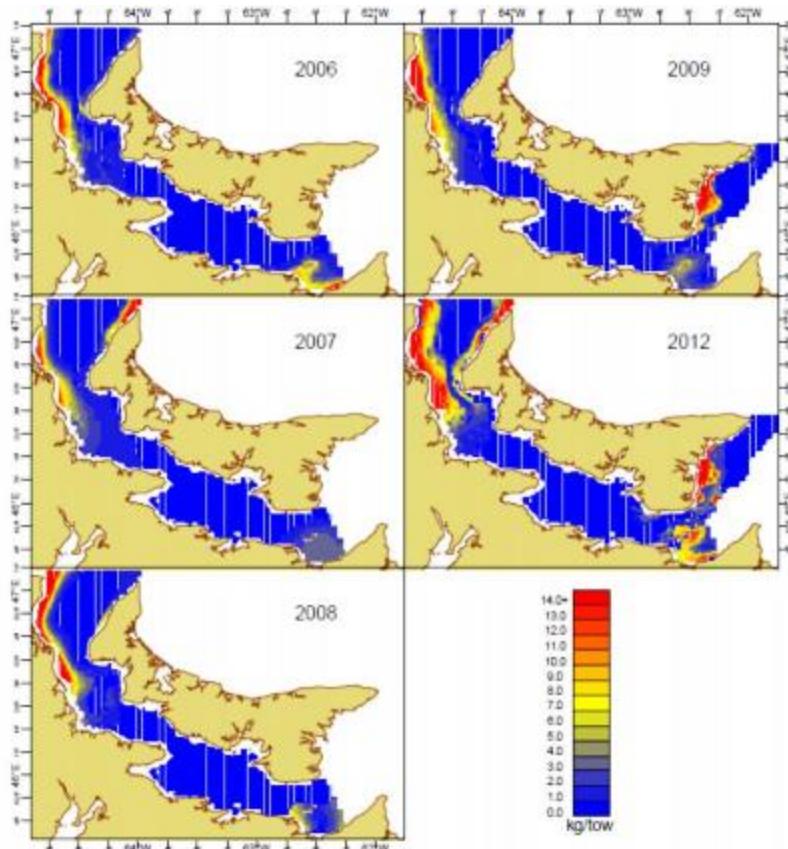


Figure 34. Spatial distribution of abundance (kg per tow) of sub-legal sizes of lobster estimated from the Northumberland Strait bottom trawl survey during 2006 to 2009 and 2012. Sub legal-sizes of lobster for 2006 to 2009 are < 70 mm CL and for 2012 < 71 mm CL. Source; DFO 2013b.

In 2012, biomass indices of sub-legal lobsters were above the times series average in the three sub-regions covered by the trawl survey (Figure 25). The spatial proportion of high densities areas (> 400 kg of sub-legal size lobsters per km²) remained low between 2001 and 2009 but increased in 2012 by 3.1-fold from the 2001-2009 series average.

The operational sex-ratio calculated represents the number of males available for mating with each female (non-berried). In LFA 25, the sex-ratio of legal size lobster significantly increased between 2007 and 2012 and always favours males, being slightly >1. For sub-legal lobsters in LFA 25, sex-ratios were near parity, with 3 years out of 4 slightly favour females, but differences were not significant between years. In LFA 26A, ratios for legal size lobsters were always slightly >1 but not significantly different between years and for sub-legal lobsters, ratios favour females 3 years out of 4 with a significant difference between years.

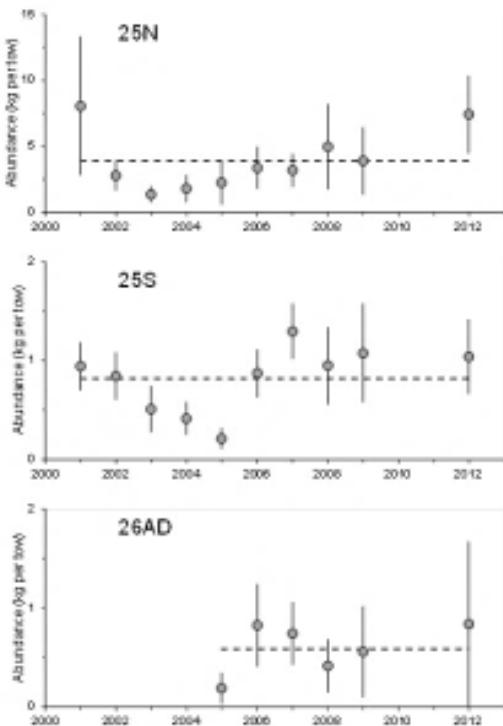


Figure 35. Trends in abundance (kg per tow, mean and 95% confidence interval range) of sub-legal sizes of lobster in sub-region 25N (upper panel), 25S (middle panel) and 26AD (bottom panel) as estimated from the bottom trawl survey, 2011 to 2009 and 2012. The horizontal lines are the mean values for the time series, 2011 to 2012 except for sub-region 26AD where the mean is calculated for the years 2005 to 2012.

The abundance of 1-year old lobsters was assessed by SCUBA diving between 2003 and 2012. The abundance of those lobsters has increased dramatically in the SGSL from stable (low) levels in the 1990s and early 2000s. The global mean abundance increased by more than 6.5-fold, from 2.0 in 2003 to 13.1 lobsters/400m² in 2012. The increasing trend was observed in sub-region 23BC, 23G and 25N while no increase on lobster <32 mm carapace size was observed in sub-region 25S (Table 22). A negative trend was observed in sub-region 26AD (Table 23) with the lowest abundances in the SGSL. Increasing the MLS, in order for females to reach SOM₅₀, and the protection of large and fecund window-size females (maximum size in LFA 25) seemed to have favoured higher recruitment.

The abundance of young-of-year (yoys) observed in bio-collectors varied between sub-regions (Figure 36). Except for one yoy observed in Nine Mile Creek in 2009, no yoy was observed in bio-collectors in LFA 25S or 26AD. No yoy was also observed in Caraquet in 2008. The highest yoy abundance in 2008 at 0.6 yoy per m² was observed in Neguac located in sub-region 23G. A positive trend was observed in Skinner's Pond (LFA 25N) between 2009 and 2012 with a steady increase from 0.1 to 0.7 yoy per m². Yoy abundances in Arisaig (26ANS) were on a downward trend since the peak value (0.2 yoy per m²) in 2009 with a value of 0.1 yoy per m² in 2012.

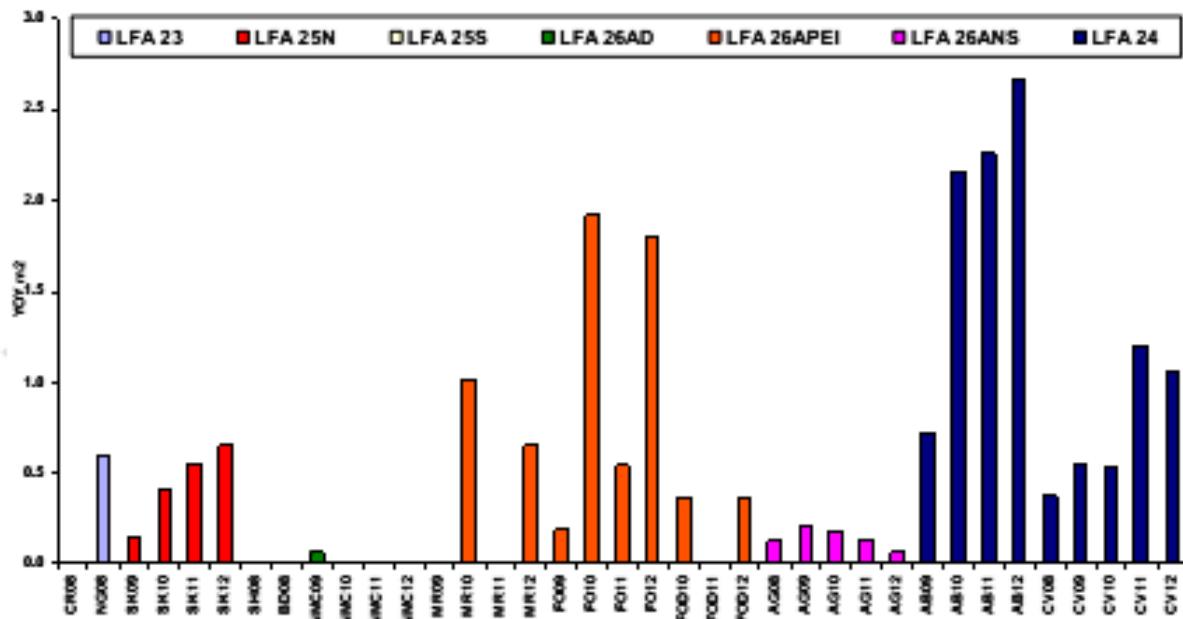


Figure 36. Empirical mean number of young-of-year lobsters per square meter observed in various site around PEI between 2009 and 2012. Source; DFO 2013 Draft.

Conclusion

Based on fishery dependent and independent indices, there is an increased in abundance of commercially lobster in all LFAs with the exception of sub-region 26AD (DFO 2013b and 2013Draft). Lobsters in the SGSL continue to be in high abundance with recent landings above long-term medians or the highest of the time series. The only area with weak or negative trends is still central Northumberland Strait (sub-region 25S and 26AD) and based on the SCUBA abundance index, the abundance of small animals (<50 mm CL) in this area is low.

The size frequency distribution is still truncated revealing a recruitment type fishery. Production relies mainly to primiparous females. Once a female lobster matures, it basically follows an alternate year molt/spawn cycle which means that those females that mature at sizes equal to and larger than MLS molt and grow to that size in one summer and are exposed to high exploitation rates in the next fishing season before getting the chance to spawn in the summer of that year. This means that the bulk of population egg production is by females smaller than MLS which for the most part are spawning for the first time and producing lower quality eggs. The lobster population is therefore very sensitive to environmental fluctuations.

4.3.1.3. Uncertainties

There is continued concern regarding the accuracy of the catch data derived from the official catch system and the delay of availability of these data. There are uncertainties in the amount of non-recorded lobster catches corresponding to other sales, personal consumption and potential illegal fishing. The time delay limitation is obvious in the last stock assessment, as the analysis of landings trends could only be done on 2011 preliminary data. Furthermore, in term of stock assessment, the current system does not collect any information on fishing effort.

Landings and information gathered from recruitment-index program and at-sea sampling program are function of abundance, level of fishing effort and catchability. Catchability in turn is affected by environmental conditions, gear efficiency, and other factors. Changes in any of these can affect landings and indices of abundance based on catch rates. Thus, indicators derived from these sources would not necessarily reflect changes in abundance, fishing pressure, or production.

None of the fishery independent indicators of stock status are available for all LFAs and only landings data provide an index of abundance for the entire SGSL, which makes an assessment of the status of the resource difficult.

There are no estimates of total biomass of lobster in the SGSL, in terms of biomass available to fishery or biomass of reproductive females. Landings are used as a proxy of biomass and berried female index from at-sea sampling as a measure of reproductive potential. The validity of these proxies has not been demonstrated.

4.3.1.4. Reference points

In 1995, the FRCC recommended to consider egg production per recruit (EPR) as a target when considering conservation measures. The recommendation was to reach a level of 5% compared to a virgin population. In 1997, the Minister of Fisheries and Oceans formally requested to prepare conservation plans, starting in 1998, that would double EPR over a 2-3 years period (DFO 1998, Gagnon and Gendron 2001). This value was used by the FRCC in 2007 to assess the effect of conservation measures, and, therefore, doubling EPR can be considered as a reference point.

In 2009, DFO published a Fishery Decision-Making Framework Incorporating the Precautionary Approach, which required to define stock status zones, created by defining the Limit Reference Point (LRP) at the Critical: Cautious zone boundary, and an Upper Stock Reference Point (USR) at the Cautious: Healthy zone boundary (DFO 2009). Those limits should lead to harvest control rules and tools corresponding to the stock status. In that context, new reference points have been proposed and approved through a peer review process January 2014 (DFO 2014a). Landings are used as the stock status indicator and as a proxy for the estimation of B_{MSY} . The median landing for the 1974-2009 period for the entire SGSL is proposed as a proxy value for B_{MSY} . The USR value is defined as 80% of B_{MSY} and the LRP is defined as 40% of B_{MSY} (DFO 2009) (Table 24). Landings from 2011 indicate that the stock is in the healthy zone, above both the USR and B_{MSY} values (Table 24). Preliminary lobster landings for 2012 and 2013 in the Gulf Region indicate higher values than those of 2011.

Table 24. Lobster landing values corresponding to the proxy for biomass at maximum sustainable yield (B_{MSY}), the upper stock reference (USR), and the limit reference point (LRP) for the entire southern Gulf of St. Lawrence lobster stock. The 2011 landings are shown and the position of the stock in 2011 within the status zones is shown (healthy, landings \geq USR; cautious, USR $>$ landings $>$ LRP; and critical, landings \leq LRP).

Period	B_{MSY} proxy	USR (80% B_{MSY})	LRP (40% B_{MSY})	2011 landings	Stock status zone
1974-2009	17,247 t	13,798 t	6,899 t	19,062 t	Healthy

The landings between 1916 and 1976 fluctuated around the LRP value as defined above. It is unknown whether the LRP as defined is actually a limit below which serious harm would occur to the stock. Based on historical trends in the SGSL, landings increased to historical record values after 1974. That increase, which occurred over the entire geographical range of the species, is most likely due to favorable ecosystem conditions that occurred beginning in the late 1960s and 1970s.

4.3.1.5. Harvest Strategy, Harvest Control Rules and Tools

The SGSL lobster fisheries are managed by effort control (input fishery). The four most important measures in controlling effort are the limited entry of lobster fishing licences, an individual trap allocation, restrictions on gear characteristics, and a limited fishing season. In addition to those management measures, other measures were implemented to protect key components of the lobster population. Lobster can only be retained if they comply with a MLS designed to allow a portion of females to reach sexual maturity before being harvesters. Egg-bearing female must also be released. Management measures and dates of fishing season are announced by DFO through Notices to Fish Harvesters (DFO 2012b, 2012c, 2012d and 2013a).

In 1995, the Conservation Framework for Atlantic Lobster (“1995 Report”) published by the Fisheries Resource Conservation Council (FRCC) indicated that most of the Atlantic lobster stocks were overexploited. The FRCC formulated objectives and recommended conservation measures. The two main objectives were to increase the egg production (eggs-per-recruit) and to reduce the exploitation rate and the effective fishing effort.

The FRCC recommended that eggs-per-recruit be increased to five percent of an unexploited population for all LFAs. The Council recognized that the five percent target was somewhat arbitrary and that it is not possible to determine precisely the minimum value of eggs-per-recruit that would adequately reduce the risk of recruitment failure. Increasing the eggs-per-recruit was seen as a precautionary measure and was not offered as an absolute guarantee against lobster stock decreases or a sure path to an increase in landings. In implementing the FRCC recommendations, DFO chose to modify the target to double eggs-per-recruit rather than aim for the five percent target suggested given the appreciable uncertainties in the estimates of eggs-per-recruit of an unexploited population.

The primary measure that led to the increase in the eggs-per-recruit was an increase in the MLS. The increase in MLS in SGSL lobster fisheries is summarized in Table 25.

Table 25. Increase in the MLS (mm) since 1991 in LFAs 24, 25 and management zone 26A1. Source: DFO 2013h.

Year	LFA 23				LFA 25	LFA 26A			LFA 26B	
	23A	23B	23C	23D		26A1	26A2	26A3	North	South
1991-1996	66.7	66.7	66.7	66.7	66.7	65.1	65.1	65.1	70.0	70.0
1998	67.5	67.5	67.5	67.5	67.5	65.9	68.3	70	70.0	70.0
1999	67.5	67.5	67.5	67.5	67.5	65.9	70	70	70.0	70.0
2000	67.5	67.5	67.5	67.5	67.5	66.7	70	70	70.0	70.0
2001-2002	67.5	67.5	67.5	67.5	67.5	67.5	70	70	70.0	70.0
2003	68.5	68.5	68.5	68.5	68.5	68.5	70	70	72	72
2004	70.0	70.0	70.0	70.0	70	69.5	71.5	70	73	73
2005	70.0	70.0	70.0	70.0	70	70	71.5	73	74	74
2011	74	74	72	71	71	71	73	76	80	79
2013	76	76	73	72	72	72	73	76	81	79

In its 2007 report, the FRCC observed that the target of doubling the eggs-per-recruit was achieved in only nine of the 38 LFAs, including LFA 26B, and LFAs 25 and 26A have increased egg production by more than 50% (Figure 29, FRCC 2007). As a consequence, the FRCC further recommended setting the MLS at size of the onset of 50% sexual maturity (SOM_{50}) allowing for more primiparous females to mature before becoming available for the fishery (FRCC 2007).

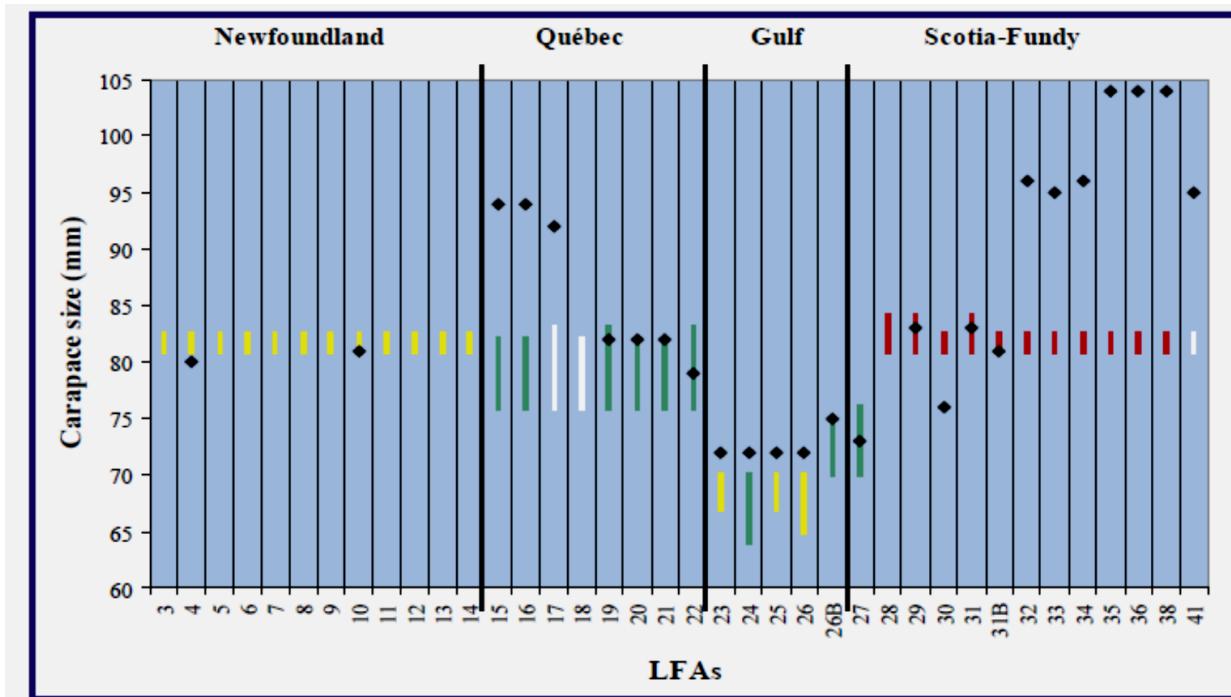


Figure 37. Increase in carapace length (mm) between 1995 and 2006 in each LFA in relation to the size at sexual maturity (black dot). Bars in green represent where the doubling of eggs-per-recruit (100%

increase) was achieved, the yellow bars where the eggs-per-recruit increase was $\geq 50\%$ and red bars, where the eggs-per-recruit increase was $< 50\%$. White bars show where eggs-per-recruit increase was not assessed because it was not a concern given low exploitation rates (LFA 17 and 41) or because of the absence of information (LFA 18). Source: FRCC 2007.

Following FRCC's recommendation, the MLS was progressively increased in all LFAs (table 25). The objective of reaching SOM_{50} (72 mm, 75 mm in LFA 26B) has been met by the 2013 fishing season for all LFAs in the entire SGSL (Table 25).

No new estimates of the EPR values are available. In 2007, the FRCC concluded that the objective of doubling egg production was reached for LFAs in the SGSL, which means an increase of EPR between 0.3 to 0.8% for an increase in MLS between 6 to 10mm. As the further MLS increase lies between 2 to 6mm, it is likely to infer that the EPR increased due to that MLS progression. As mentioned above, the dramatic increase of cohort-1 lobsters indicates the improving of the reproductive capacity of the stocks.

From both 1995 and 2007 reports, FRCC also concluded that exploitation levels were too high and that fishing effort needed to be reduced. Two multiyear conservation plans (1998-2001, 2003-2005) were developed and included important reductions in fishing effort through licence retirement (reducing the number of harvesters), reduction of the number of traps occurred, and fishing only six days per week. The implementation of the ALSM program in 2009 helps Canada's lobster fishery to ensure its long-term sustainability and economic prosperity. To access funding, harvester associations had to submit an LFA-wide sustainability plan, first that would improve biological productivity, provide reliable reporting of landings and reduce ecosystem impacts. Upon approval of the sustainability plan by DFO, harvester associations within the LFA applied for the second stage of the program, by submitting a request to DFO for partial funding for specific projects, which mainly consisted of effort reduction through buyback (reducing the number of harvesters) or reduction of the number of traps.

The number of licence holders and the number of traps allocated per type-A licence were stable until 2006 (Comeau et al. 2008). Since 2006, the number of NB and NS licence holders has decreased (Table 26). The reduction of licence holders between 2006 and September 2009 was through industry funded retirement initiative, while the second stage came from the ALSM program under the restructuring and rationalization category. With the funding from the ALSM program, trap reductions were done, except in LFA 23 (Table 27). However, it is presently not possible to know if the reduction of nominal fishing effort is important enough to result in an actual diminution of exploitation levels.

Table 26. Number of renewed lobster licence for PEI lobster harvesters from 2006 to 2012. Numbers in parentheses are the total number of licences prior to the LFA division. Source: DFO 2013h.

Year	LFA 23				LFA 25		LFA 26A			LFA 26B	
	23A	23B	23C	23D	NB	NS	26A1 (NS)	26A2 (NS)	26A3 (NS)	North (NS)	South (NS)
2006	(754)				573	18	147	166	49	(247)	
2007	(753)				568	18	146	166	49	(247)	
2008	127	95	(526)		567	18	146	166	49	118	129
2009	126	95	336	186	561	18	147	166	47	188	129
2010	125	95	336	186	560	18	145	166	48	118	128
2011	124	95	336	186	560	18	134	166	36	109	118
2012	109	93	298	169	471	18	134	166	36	109	117

Table 27. Trap allocation for type-A licences for PEI lobster harvesters from 2006 to 2012. Numbers in parentheses are the trap allocations prior to the LFA division. Source: DFO 2013 Draft.

Year	LFA 23 (NB)	LFA 25 (NB and NS)	LFA 26A			LFA 26B	
			26A1 (NS)	26A2 (NS)	26A3 (NS)	North (NS)	South (NS)
2006	300	250	300	300	300	(300)	
2007	300	250	300	300	300	(300)	
2008	300	250	300	300	300	275	300
2009	300	250	300	275	300	275	275
2010	300	250	300	275	300	275	275
2011	300	250	280	275	250	250	250
2012	300	250	280	275	250	250	250

Measures were implemented gradually to minimize the immediate impact on individual harvesters while ensuring a significant impact on exploitation over time; compliance was high, and both the industry and DFO were highly committed to improving lobster stock conservation. In addition to those management measures, other measures were implemented such as eliminating large traps and fishing only 6 days a week.

However, at present no well-defined harvest control rules exist to adjust those management measures when reference points are approached.

4.3.2. Eastern Scotian Shelf (UoC 2)

4.3.2.1 Stock Assessment (DFO 2011b and Tremblay et al 2011)

For all those LFAs, there is no direct measurement of lobster biomass (empirical or analytical). The lobster stock assessment is based on the analysis of trends of stock indicators. They are primarily fishery-dependent data which consist of landings and effort data from the fishery, port and at-sea samples of the commercial catch and data from standard traps maintained by Fishermen and Scientist Research Society (FSRS) study participants. Landing levels are a function of abundance and a wide range of other factors but are still thought to be indicative of general trends and patterns of abundance. Catch rates (CPUE) are also affected by factors other than abundance. Commercial CPUE for LFAs 27-33 comes from two sources: mandatory logs and voluntary logs.

A cluster analysis of historical lobster landings (1947-2009) for Statistical District (SD) was used to group LFAs for assessment purposes. Cluster groups resulting provided three assessment units (Figure 38):

1. Northeastern Cape Breton (LFA 27);
2. Southeastern-Cape Breton, Chedabucto Bay and Eastern Shore (LFA 28-32);
3. South Shore (LFA 33).

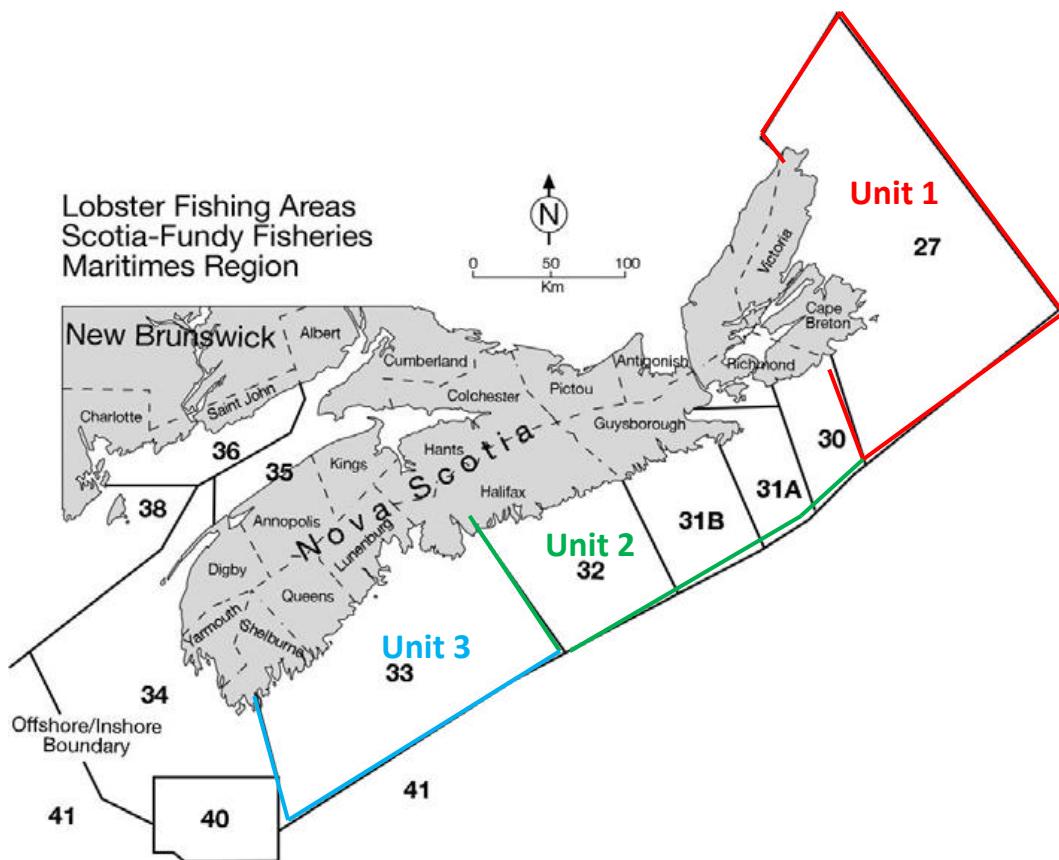


Figure 38. Map of LFAs in Eastern Nova-Scotia with the assessment units defined by a cluster analysis.
Source: Drawn from Tremblay et al. (2011).

4.3.2.1.A. Source of Data

Landings statistics

Until 1995, the database consists of a compilation of sale transactions conducted between official lobster buyers and harvesters. Although this information essentially documents monetary transactions, it is assumed that the volume sold to official lobster buyers closely tracks the quantity of lobster caught by lobster harvesters, but it does not take into account the lobsters sold directly by the fishermen. In 1995-1996, the system changed to one based on individual fishermen sending in monthly catch settlement reports. For all LFAs, the catch settlement report only provided information on daily catch by port landed and date of landing. Beginning in 2006 (2005-06 for LFA 33) a Lobster Catch and Settlement Report was introduced to all fishermen in LFAs 27-33 and participation rates have increased since, providing more accurate statistics. That report requires daily catch (weight) and effort (trap hauls) together with location by reference to a grid system.

Table 28. Summary of the statistics collected on fishing activity. Source: Tremblay et al. 2011.

Data Sources	Dates	Sales	Daily Catch	Daily Effort	Location
Sales Slips	Pre fall 1995	X			Port Statistical Area
Self Reporting Landings	Fall 1995/1996-2004	X	X		Port Statistical Area
Compulsory Logs (Lobster Catch and Settlement Reports)	2004-present (Phased in with time varying with LFA)	X	X	X	Grid Area Port Statistical Area

From 1981, in addition to the compulsory reporting system, volunteer index fishermen kept fishing logs of the weight of daily catch and the effort (number of trap hauls per day). Selection of participants was not random and was based on their willingness to contribute their information. It is assumed that annual fluctuations in the catch rates of logbook keepers reflect the fishery as a whole (Table 29). A proportion of the voluntary logs also recorded daily catches of berried females.

Table 29. Number of voluntary logbook participants, 1981 to 2009, LFA 27 to 32.

Year	LFA 27	LFA 28	LFA 29	LFA 30	LFA 31	LFA 32	LFA 33	Total
1981	1							1
1982	1							1
1983	1							1
1984	1					6		7
1985	3		2	1	1	10		17
1986	5	3	2	7	3	11		31
1987	5	3	2	10	4	18		42
1988	7	4	2	11	5	15		44
1989	9	5	2	12	3	15		46
1990	9	1	4	2	15	5	12	48
1991	8	1	5	2	15	7	13	51
1992	27	1	8	7	12	6	17	78
1993	43	3	9	6	16	11	21	109
1994	48	2	11	6	17	18	21	123
1995	53	1	8	6	13	17	23	121
1996	50		7	7	13	15	20	112
1997	48		6	7	13	11	26	111
1998	46		5	4	9	11	25	100
1999	37		5	4	7	7	23	83
2000	36		5	4	5	7	27	84
2001	35		4	4	6	8	30	87
2002	34		3	4	11	7	26	85
2003	33		2	4	9	8	25	81
2004	28		1	3	9	8	24	73
2005	24		1	2	9	8	22	66
2006	22		1	2	6	4	21	56
2007	21		1	2	3	1	21	49

2008	17	1	2	1	14	35
2009	14	1	2		14	31

At-sea sampling

At-sea samples collect information from fishermen's catch during normal commercial fishing operations. The data collected includes: carapace length measured to the nearest millimetre (from the back of eye socket to the end of the carapace), sex, egg presence and stage, shell hardness, occurrence of culls and v-notches, and number, location and depth of traps. At-sea sampling provides detailed information on lobster size-structure in the traps (including sub-legal, berried, and soft-shelled lobsters). As all lobsters retained in each trap haul are measured, the numbers caught can be converted into estimates of the catch rate of legal-sized animals by weight from known length-weight relationships.

At sea lobster data come from two databases (Table 30). The LOBBIO database from 1947 to 2000 provides a sexed length frequency on a trip basis and a total number of traps hauled and one location for the trip. From 2001 to present, the CRIS (Crustacean Research Information System) database has the ability to capture depth, location, soak days and other details on an individual trap basis. For each lobsters, the database captures a carapace length, sex, shell hardness and selected other characteristics.

Table 30. Numbers of at-sea samples stored in the LOBBIO database (top table) and in the CRIS database (bottom table) for LFAs 27-33.

LFA	SAMPLES	YEARS
27	88	1977-1999
29	23	1979-1998
30	135	1947-1998
33	13	1998-2000
Grand Total	259	

LFA	SAMPLES	YEARS
27	190	1985-2009
28	18	1993-2001
29	27	1990-2008
30	73	1990-2008
31	157	1982-2010
32	66	1981-2010
33	36	2001-2009
Grand Total	567	

Port-Sampling

Port sampling started as early as 1946, and continues seen then with a variable intensity (Table 31). During port sampling, a fisherman's landed catch is measured (carapace length), and sexed.

On average, each sample includes up to 6 crates of lobster, or the fisherman's catch for the day. This information is captured on a voice recorded and later transcribed onto paper for data entry into the LOBBIO database. In the past, location of the samples was available only at the level or port landed. However, in more recent years, whenever possible the fishing grid from the Lobster Catch and Settlement Report is associated with the sample.

Table 31. Numbers of port samples by LFA and year.

YEAR	LFA							TOTAL
	27	28	29	30	31	32	33	
1946							1	1
1947							1	1
1949							1	1
1977					1	1		2
1978	4							4
1980	46			10	5			61
1981	20			5		1		26
1982	37		7	2	12			58
1984	20				4	2	11	37
1985	45		2	1	4	2	8	62
1986					4	3	7	14
1987	4				4	2	17	27
1988					4	2	13	19
1989	34		7		4	2	11	58
1990	20		3		4	2	7	36
1991	9		3		3	2	8	25
1992			1		4	2	9	16
1993	2		5	2	4	2	8	23
1994	6	2	10	2	4	2	8	34
1995	4	1	4	3		1	8	21
1996	56		6	2	4	2	8	78
1997	32		4	1			10	47
1998	25	1	64	10	6	2	15	123
1999	26		6		4	4	10	50
2000	24		18		9	7	11	69
2001	22		6		6	4	5	43
2002	10		3		7	4		24
2003	10		4		8	4		26
2004	6		4		12	3		25
2005	4		2		5			11
2006					9	1	6	16
2007	4		1		4	1	3	13
2008	9		1				7	17
2009	9		3		1		15	28
2010							5	5
TOTAL	488	4	164	38	136	58	213	1101

FSRS recruitment traps

The FSRS recruitment trap project involves volunteer fishermen keeping track of the lobsters caught in project traps. Fishermen participants use standard traps and a standard gauge to assign each lobster captured to a size group. Participants in the project are distributed along the Atlantic coast of Nova Scotia. The number of participants in LFAs 27-33 was 67 in 1999, but increased steadily to 132 in 2006. The number of participants was 122 in 2009 (Table 32). Participants record size, sex and presence of external eggs for all lobsters collected in standard traps on each day of commercial fishing. Compared with commercial traps, the FSRS wire traps have features that lead to greater retention of pre-recruit lobsters: smaller mesh size (2.5 cm), smaller entrance rings (12.5 cm), and no slots to allow sublegal sized lobsters to escape. As such, the FSRS traps provide a better indication of the abundance of pre-recruit lobsters than commercial traps. Lobster measurements were made with an FSRS gauge that facilitates data collection in the field by fishers. Fishermen were asked to set the traps in one location throughout the season. The standard traps were equipped with temperature recorders that provided data on nearshore bottom.

Since the traps are the same throughout the study area, they allow for a better comparison between areas that may have several different designs of commercial traps. The data provided by that program could be considered, therefore, as “quasi” fisher-independent data.

Table 32. Number of participants in the FSRS recruitment trap project, 1999-2009, LFA 27-33.

YEAR	LFA 27	LFA 28	LFA 29	LFA 30	LFA 31A	LFA 31B	LFA 32	LFA 33	SEASON	TOTAL
1999	21	0	1	0	4	4	14	23	1998-1999	67
2000	23	0	4	2	4	8	11	31	1999-2000	83
2001	24	2	4	2	5	8	11	30	2000-2001	86
2002	23	2	4	2	6	12	13	32	2001-2002	94
2003	28	2	4	3	6	12	13	42	2002-2003	110
2004	29	2	4	2	6	9	14	46	2003-2004	112
2005	28	2	4	4	6	12	18	52	2004-2005	126
2006	30	1	6	7	7	12	18	51	2005-2006	132
2007	30	1	8	7	8	12	18	47	2006-2007	131

The type of information collected by source of data is summarized in the table 33.

Table 33. Summary of source of data and information collected. Source: Tremblay et al. 2011.

Data Sources	Fishing Location	Depth	Lobster Size	Sex	Berried Females	Sublegal Sizes	Window Max Size	V-notch	Trap Type	Bycatch	Scale of Measure	Timing
Port Samples	Port		X	X							1mm	Periodic but variable
At Sea Samples	Lat/Long	X	X	X	X	X	X	X	X	X	1mm	Periodic but variable
FSRS	Lat/Long	X	X	X	X	X	X		X		10mm 5mm	Daily

4.3.2.1.B. Determination of Indicators

The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production.

Landings, fishing effort, catch rates (from mandatory commercial and from voluntary commercial logs), and the median sizes in the commercial catch were all deemed indicators of fishery performance.

Abundance

Landings

Landings have been identified as an initial candidate for reference points in recent Integrated Fisheries Management Plans (IFMPs) in the Maritimes Region (DFO 2011a).

Landings data are available from various sources since the 1890s, and they have been used historically as an indicator of the state of the fishery. However, landings levels are a function of abundance, level of fishing effort (trap hauls and Soak Over Days), timing of effort, fishing strategy, catchability (environmental, gear efficiency, density), and availability. Changes in any of these can affect landing levels. Thus, changes in landings are not a direct reflection of changes in abundance.

Major changes in effective effort occurred during the 1980s and 1990s that were brought on by changes in vessels, traps and ship board electronics (i.e. sounders, radar, Loran, Global Positioning System (GPS), mapping). These changes make comparison with older historical landings questionable. However, the long-time series available can give indications of general trends and patterns in abundance.

To classify periods of high and low landings, the landings were divided into quartiles. Values that were less than the 25th percentile of the time series were classified as “negative”, values between the 25th and 75th percentile were classified as “neutral”, and values that were greater than the 75th percentile were classified as “positive”. Three time periods were looked at: Historical data: 1892-2010; 1947-2010 and 1970-2010. The latter time period was chosen to reflect the more recent fishery following introduction of limited entry and trap limits in 1968.

Catch rates from commercial mandatory logbooks

Commercial logs (also known as Lobster Catch and Settlement Reports) have been mandatory since 2004-05; however, there was a phase-in period in some LFAs with the older Self Reporting landings forms submitted, and in the initial years records were often incomplete. Reports have been good since 2006 or 2007. As a result, the time period presently available for analysis is three years and not enough for detailed analysis. The data available have been used to calculate an overall seasonal CPUE to allow comparison with other data sources. In future assessments, the logbook results could be standardized.

Catch rate (CPUE) calculated from the logbook data are expressed in kg per trap haul. Two calculations are made. The average CPUE of all CPUEs calculated for each record. A record represents each day fished per licence. This is then weighted by the number of records. The CPUE by totals is the total weight / total trap hauls. This is then weighted by the number of records.

Catch rates from voluntary logbooks

Due to of the declining numbers of logs in most LFAs it is not possible to compare the results with the mandatory log records so only LFA 27 and 33 were looked at.

Only logbooks which met the following criteria were used: Class A licence; Fished at least 4 consecutive seasons; In LFA 33 fished both fall and spring and in LFA 27 fished all months of the season. CPUE was calculated by Statistical District (SD) by dividing reported landings by reported effort. The CPUE for LFA 27 North and South, and LFA 33 West were calculated using a weighted mean (based on landings) of the CPUE from each SD. CPUE was not calculated for LFA 33 East because too few SD were covered by the voluntary logs.

Catch rates from FSRS logbooks

Data from FSRS traps may be the best source of catch rate data available for LFAs 27-33 in that they come from standard traps fished in fixed locations. They are not totally fishery-independent in that they are hauled only during the fishing season when project participants are tending their commercial gear. In order to standardize CPUEs, a GLM statistical model was tested for area 27. The CPUE was modeled with a mixed effects model. CPUE was modeled as a function of the week of the season for each fisherman within a location and year with the parameter estimates for each fishermen set as random effects. The fact that the effects of fisherman and location are aliased, together with changes in participation over time makes it difficult to extract a fisherman effect independent of the year effect. As such, catch rate was modeled as a function of the week of the season for each fisherman within a location and year with the parameter estimates for each fishermen set as random effects. As a result, GLM models were applied to each individual LFA. CPUE was modeled as a function of week, year, and vessel with the latter as a fixed effect.

Fishing pressure

Fishing effort

Fishing effort can be measured as days fished (total and average per fisherman) and trap hauls (TH). Daily trap hauls are reported in logbooks. To correct for incomplete recording, total effort was estimated in two ways. First, the reported effort was adjusted using the percentage of total logs records with effort recorded. The second method involved dividing the total landings by the uncorrected catch rate based on records that reported catch and effort in the logs.

Exploitation rate

An index of exploitation rate (ER) was estimated using the Continuous Change in Ratio (CCIR) method, which utilizes the change over the course of the fishing season of the ratio between an unharvested size class (reference class) and a harvested size class in FSRS recruitment traps. The harvested size class was defined as MLS to 90 mm CL or 81 to 90 mm CL (LFA 27 only). Estimates were done for subunits and then weighted by landings to provide an index for the assessment unit as a whole. Weighting by landings was thought to be most appropriate for ER.

Production

Abundance of berried females

An index of the abundance of berried females is derived from two sources. In area 27, CPUEs (no of lobsters/trap haul/fisherman/yr) of FSRS traps are used. CPUE is not standardized. CPUEs from voluntary logbooks are used for all the LFAs. Data are standardized as for CPUEs of legal lobsters

Abundance of sub-legal lobsters

Catch rates in the FSRS recruitment traps were used to analyse the trends in abundance of sub-legal lobsters. The treatment is the same as for the legal size lobsters.

Egg index

An egg index was developed for LFA 31a.

Landings and at sea samples were assigned to log grid areas where grids information existed. Where no grid information existed, landings were assigned to the grids based on the port of landing. Landings and at sea samples were pooled by month (May/June). The sea sample was converted to

estimated weight at size based on a length weight relationship. The size frequency was expanded by the ratio of the weight of the legal catch in the sample and the landed catch to give an estimate of weight at size for each grid area and month. Weight at size was converted back to number at size using a length weight relationship. The numbers at size for each month and grid were combined to give an estimate of the numbers landed at size in the LFA. Ovigerous female numbers were converted to number of eggs based on a Length Fecundity relationship. The Egg Index was the total number of eggs $\times 10^{-6}$.

4.3.2.2 Stock Status (DFO 2011b and Tremblay et al 2011)

Abundance

Landings

Considering the history of the fishery, differences are seen in LFA 27-33 (Figure 39). LFA 27 appears to be an exception in that an initial period of high landings followed by a decline is not evident in the data. Landings remained relatively constant through the 1892-1965 period. A decline in the 1970s is evident but less pronounced than in many other areas. Landings then rose rapidly to unprecedented levels during the 1980s and peaked in 1990 followed by a similarly sharp decline before levelling out in 1997. Landings have increased since 2000, with 2009 landings at 56% of the peak of 1990 and 2 times the long term mean 1892-1980.

LFA 28-31 exhibited the large decline during the 1890s and early 1900s and was followed by smaller peaks in the early 1930s and mid-1950s. An all-time low occurred in the late 1970s. As with LFA 27 landings increased during the 1980s and peaked in 1990, though the increase was much smaller than observed in LFA 27. Landings rose sharply between 2004 and 2009, with 2009 landings 4.5 times those of 2004 and almost matching the all-time highs of 1895.

LFA 32-33 exhibited the large decline during the 1890s and early 1900s and was followed by low landings through the 1930s and 1940s. A small increase is evident in the early 1950s but by the 1960s is in decline reaching all-time lows in the late 1970s. As observed in other lobster areas landings increased during the 1980s and in LFA 32-33 peaked in 1987. Though landings decline in the early 1990s they remained above levels observed since 1920s and since 2004 have increased. The 2009 landings are at 1.4x the peak of 1987 and 16x the record low of 1978, though still below the all-time highs of the 1890s.

In conclusion, historical landings (pre-1947) for LFAs 27-33 show some large changes associated with the early days of the fishery and other changes associated possibly with changes in effort. Peaks and troughs have been observed within all of the assessment units in the past with both rapid increases and rapid declines in landings. In all areas the lowest landings of the time series occurred during the 1970s and with the exception of LFA 27 the highest landings occurred during the last 5 years. Recent increases in landings (2005-2010, Table 34) are believed to reflect increased abundance. The specific factors controlling abundance and subsequent landings have not been determined.

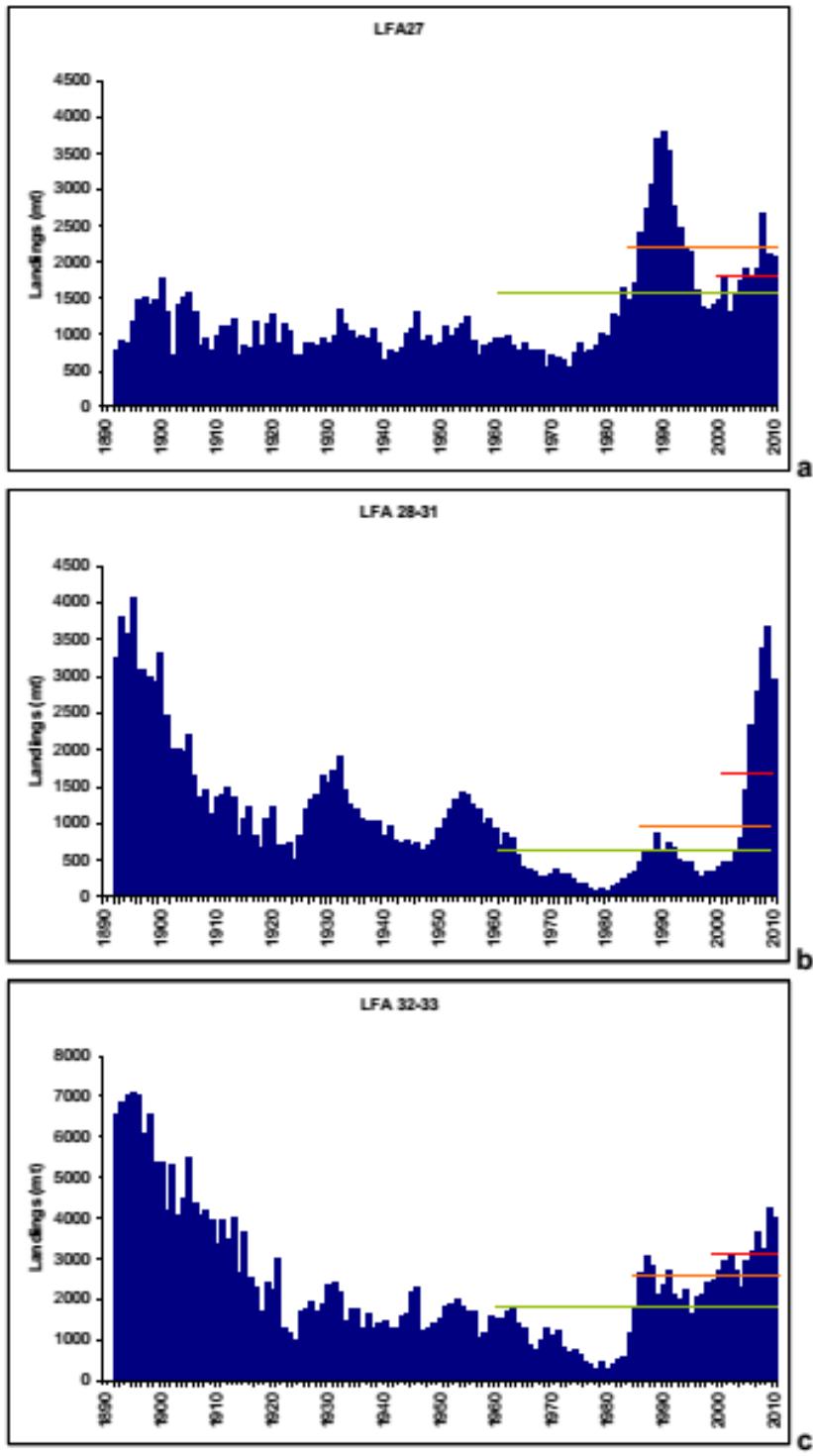


Figure 39. Lobster landings 1892-2010 (2010 preliminary) a) LFA 27, b) LFA 28-31, c) LFA 32-33; showing mean landings for recent 10yr , 25yr , and 50yr . Source: Tremblay et al 2011.

Table 34. Lobster landings for LFA2 27-33 in 1947-2010. Values that are less than the 25th percentile of the time series were classified as “negative” (black cells), values between 25th and 75th percentile were classified as “neutral” (grey cells), and values that are greater than 75th percentile were classified as “positive” (white cells). Source: Tremblay et al 2011.

Year	LFA27	LFA28-29	LFA30	LFA31	LFA32	LFA28-32	SEASON	LFA33	LFA27-33
1970	713	43	40	213	263	559	1969-70	836	2108
1971	674	59	48	263	276	646	1970-71	986	2306
1972	641	61	43	222	194	520	1971-72	616	1777
1973	547	56	29	218	187	490	1972-73	485	1522
1974	748	43	30	162	141	376	1973-74	595	1719
1975	893	39	37	119	91	286	1974-75	531	1710
1976	749	29	39	110	86	264	1975-76	382	1395
1977	795	24	29	68	84	205	1976-77	352	1352
1978	838	20	20	48	53	141	1977-78	213	1192
1979	1014	34	19	51	49	153	1978-79	416	1583
1980	975	23	13	41	66	143	1979-80	248	1366
1981	1267	45	35	70	56	206	1980-81	363	1836
1982	1227	50	27	94	70	241	1981-82	448	1916
1983	1658	63	62	120	109	354	1982-83	461	2473
1984	1502	74	69	169	140	452	1983-84	1044	2998
1985	1721	113	60	183	180	536	1984-85	1658	3915
1986	2420	154	85	223	284	746	1985-86	2385	5551
1987	2763	200	99	303	258	860	1986-87	2794	6417
1988	3072	203	77	326	222	828	1987-88	2589	6489
1989	3714	257	132	482	239	1110	1988-89	1888	6712
1990	3790	172	119	365	303	959	1989-90	2037	6786
1991	3526	168	151	401	298	1018	1990-91	2420	6964
1992	2778	150	167	358	304	979	1991-92	1849	5606
1993	2458	104	132	284	279	799	1992-93	1731	4988
1994	2190	104	130	240	262	736	1993-94	1968	4894
1995	2142	107	126	229	219	681	1994-95	1395	4218
1996	1616	75	90	176	225	566	1995-96	1825	4007
1997	1379	51	80	148	243	522	1996-97	1867	3768
1998	1346	64	70	200	309	643	1997-98	2104	4093
1999	1419	55	70	217	316	658	1998-99	2162	4239
2000	1499	59	54	299	448	860	1999-2000	2297	4656
2001	1818	71	98	304	433	906	2000-01	2521	5245
2002	1292	65	79	313	358	815	2001-02	2753	4860
2003	1540	138	73	431	389	1031	2002-03	2344	4915
2004	1735	198	84	518	289	1089	2003-04	2006	4830
2005	1919	411	112	924	403	1850	2004-05	2524	6293
2006	1820	654	187	1497	601	2939	2005-06	2596	7355
2007	1910	772	215	1821	620	3428	2006-07	3040	8378
2008	2674	1043	399	1932	687	4061	2007-08	2574	9309
2009	2130	1036	462	2171	776	4445	2008-09	3478	10053
2010	2083	796	357	1817	611	3581	2009-2010	3429	9093

Catch rates

From commercial logbooks, the overall observation is that over the period of time the data are available, CPUE shows few trends (Figure 40). Catch rate varied little in LFAs 27, and 32. LFA 33 was higher in recent years, while LFAs 29, 31a and 31b showed increases in the early part of the time series (2005-2006) and have remained constant since. LFA 30 showed an increasing trend up to 2009. All of these also show a small downturn in 2010.

When comparing CPUE and fishing effort, catch rate either shows no relationship to effort levels or higher levels at higher effort levels, which suggests effort increased in response to the higher CPUE. Thus, the recent increases in landings are primarily due to increased CPUE (and presumably abundance) and not to increased fishing effort.

The voluntary logbooks indicate that, in all the LFAs, a decline in CPUE is observed in the early 1990s followed by increased CPUE (Figure 40). The rate of this increase varies with the largest and most rapid changes observed in LFA 31a and 31b. In this time series, the most current CPUE levels are the highest in LFA 31a, 31b and 32. In LFA 27 and 33, these levels are similar to those of the period of higher landings in the early 1990s.

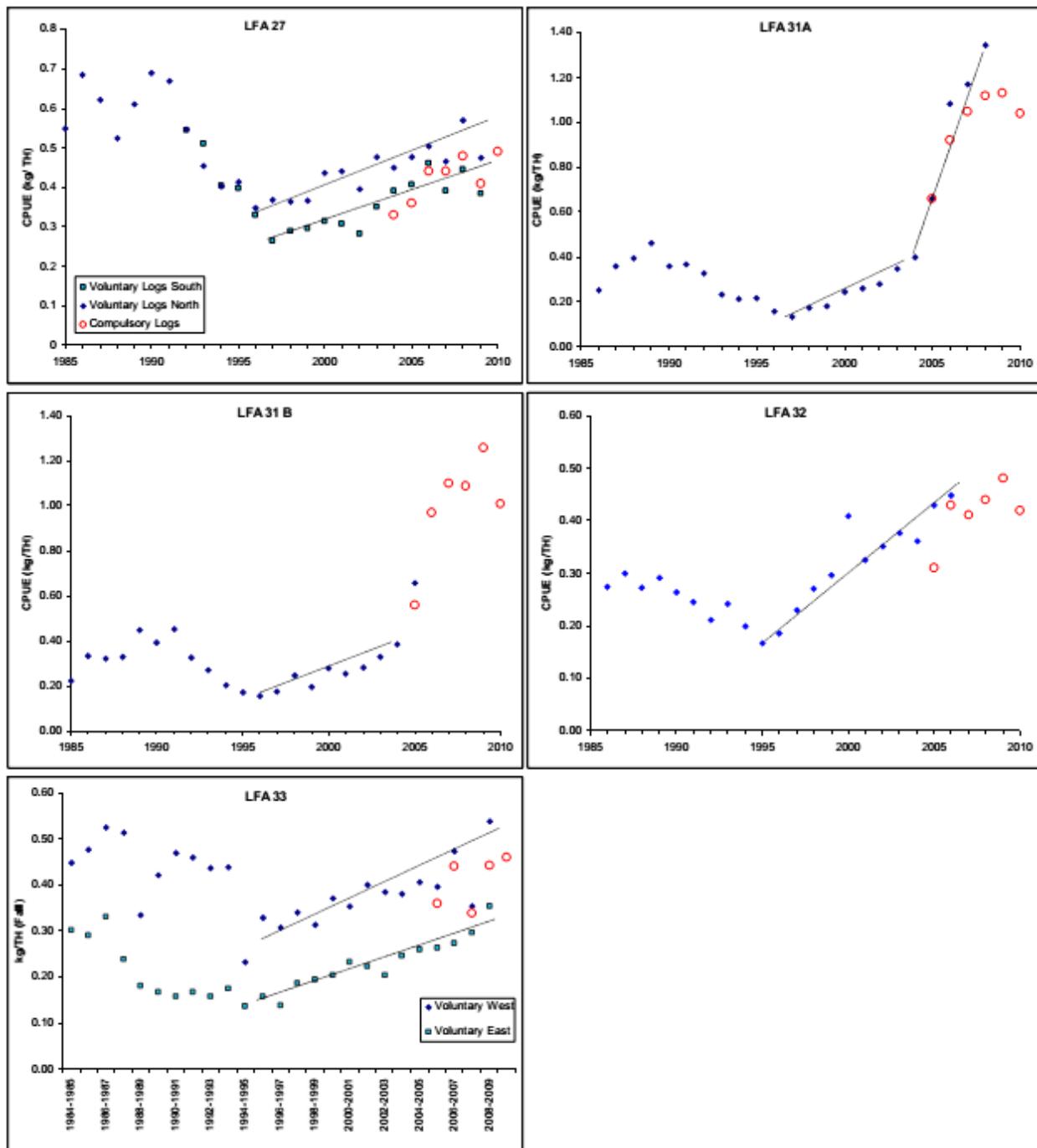


Figure 40. Mean CPUE (kg/TH) from voluntary logs and compulsory logs for LFA 27 (north and south), 31a, 31b, 32 and 33 (East and West). Source: DFO 2011b.

Fishing pressure

Fishing effort

Three estimates of number of trap hauls (TH) are provided. One estimate is the number of TH corrected for reporting rate. Another one is back-calculated from CPUEs. The last one is simply the reported TH in the logbooks. The data (Figure 41) show increases in the estimated trap hauls since 2004 with many

LFAs peaking in 2008 and either remaining near that level (LFA 31a, 31b, 33) or declining (LFA 27, 29, 30, 32).

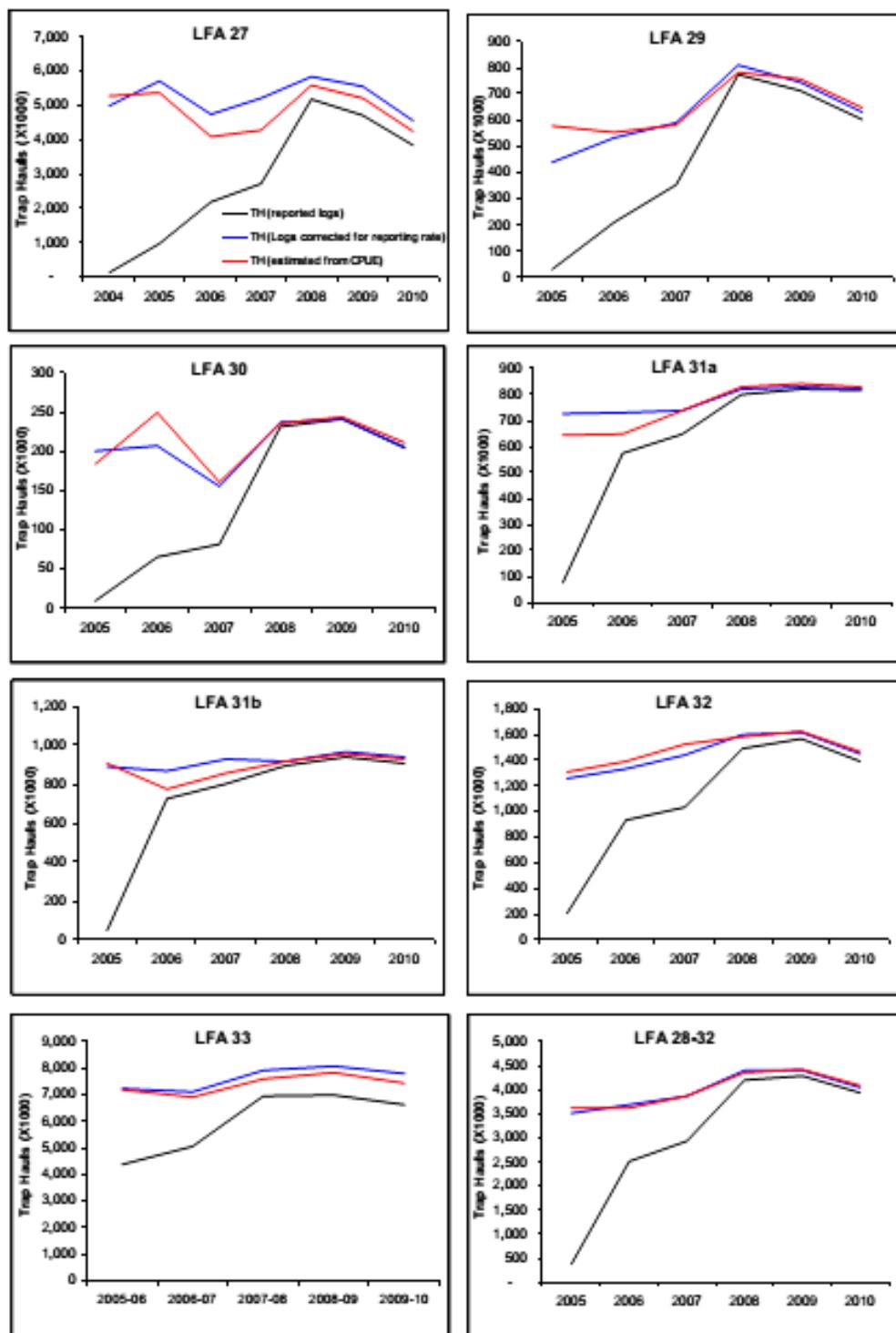


Figure 41. Total trap hauls (TH) reported in the mandatory logs and estimated total TH based on reported TH corrected for proportion of logs reporting and based on landings/CPUE from logs. Source: DFO 2011b.

Exploitation rate (ER)

For LFA 27, the overall estimate was calculated for the period 1999-2010. The exploited size group was 81-90 mm CL, the reference size group 71 mm CL to MLS. The mean ER was calculated by weighting the calculation for each subunit by their landings. An extended estimate used an exploited size group of 76-90 mm CL, and a reference size group of 71 mm CL to MLS.

Mean estimated ER for 2008-2010 (0.77) is close to the median for 1999-2007 (0.76). Extended ER estimates provide some accounting for the fact that this area is no longer exploiting lobsters between 76 and 81 mm CL. The extended ER estimates for 2009-2010 indicate ER is 29% lower than during the 1999-2008 period.

Strict ER estimates for LFA 27 as a whole fluctuated without trend (Figure 42). Increased MLS has reduced exploitation overall (extended ER estimates).

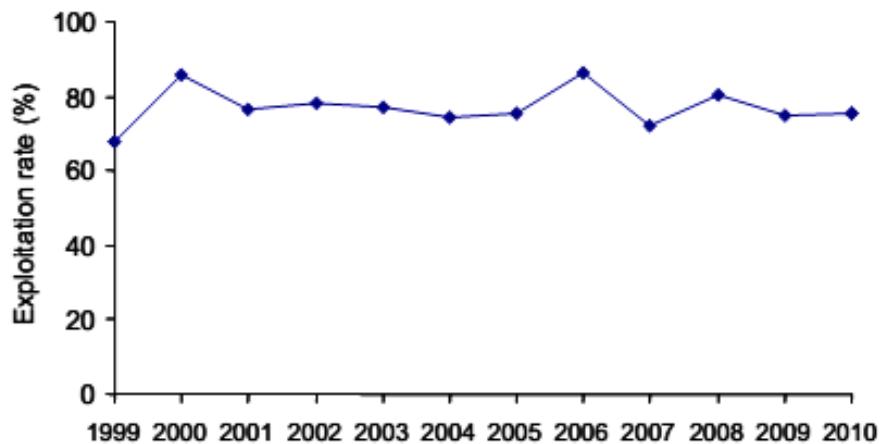


Figure 42. ER index for LFA 27 as a whole based on weighting subunit estimates by landings. Source: DFO 2011b.

For LFAs 29-32, the weighted ER estimates for LFAs indicate a slight downward trend, with an unexplained trough in 2003 (Figure 43). The most recent estimates are below the median and mean. Mean ER for 2008-2010 (0.61) is below the median for 2000-2007 (0.70).

Exploitation rates as high as or higher than current levels allowed a pulse of recruits to come through that were still in the fishery in the 2010 season. Lower exploitation rates may have extended the benefits of this pulse but current levels of ER appear sustainable under current conditions.

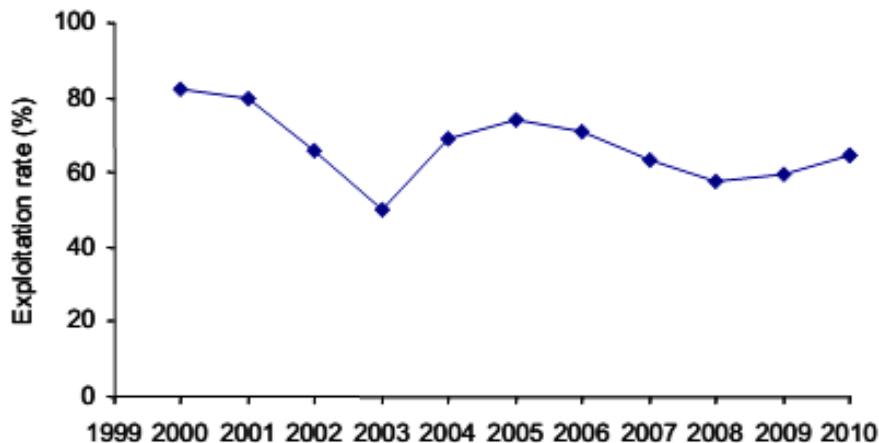


Figure 43. ER index for LFAs 29-32 as a whole based on weighting LFA estimates by landings. Source: DFO 2011b.

For LFA 33, ER estimates for males fluctuated mainly without trend but there was some downward trend in the estimates for females. The weighed ER estimates (Figure 44) show this slight downward trend. Mean ER for 2007-2008 to 2009-2010 (0.67), is below the median for 1999-2000 to 2006-2007 (0.76).

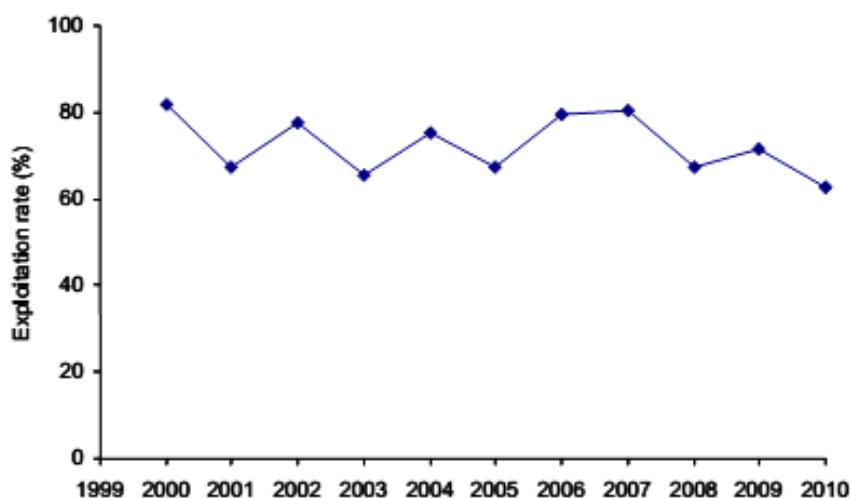


Figure 44. ER index for LFA 33 as a whole based on weighting subunit (east and west) estimates by landings. Source: DFO 2011b.

Size frequency distribution

The median sizes in LFA 27 show a continual increase of the period 1994- 2009, because of ongoing increases in the Minimum Legal Size (MLS). The Coefficient of Variation of the size distribution is observed to decrease with a smaller CV indicating less variability and thus the catch more concentrated on a smaller range of sizes. The median sizes in LFA 29 showed decrease 1999-2005 but increased 2007-2009, 31a, and 31b showed similar decreases but data lacking for most recent years. The CV in LFA 29 decreased 1999-2004 and has remained constant. The CV in LFA 31a, and 31b showed smaller and more variable decreases, but data lacking for most recent years. No trend is observed in LFA 32. A smaller CV

indicating less variability and thus the catch more concentrated on a smaller range of sizes. The median sizes in LFA 33 fluctuate without trend as does the CV.

The overall conclusion for all LFAs is that it “is highly unlikely that current levels of exploitation threaten sustainability of lobsters in LFA 27 under current environmental conditions” (Tremblay et al. 2011).

Production

Abundance of berried females (Figure 45)

For LFA 27, the CPUEs of ovigerous females are calculated from FSRS recruitment traps and from voluntary logbooks. Both sources indicate an increase of the overall abundance of ovigerous females over the period 1999-2009. For the FSRS CPUEs, the 2007-2009 median was 0.41 compared to 0.27 for the entire period. For the voluntary logbooks, the 2007-2009 median was 0.26 > median for 1999-2009 (0.19).

In the LFAs 29-32, voluntary logbooks were used. An increase in abundance of ovigerous females in some LFAs in recent years was observed. In LFA 33, the voluntary logbooks CPUEs indicate a possible increase since 1980s-1990s. Those CPUEs were lower than in LFAs 27-31.

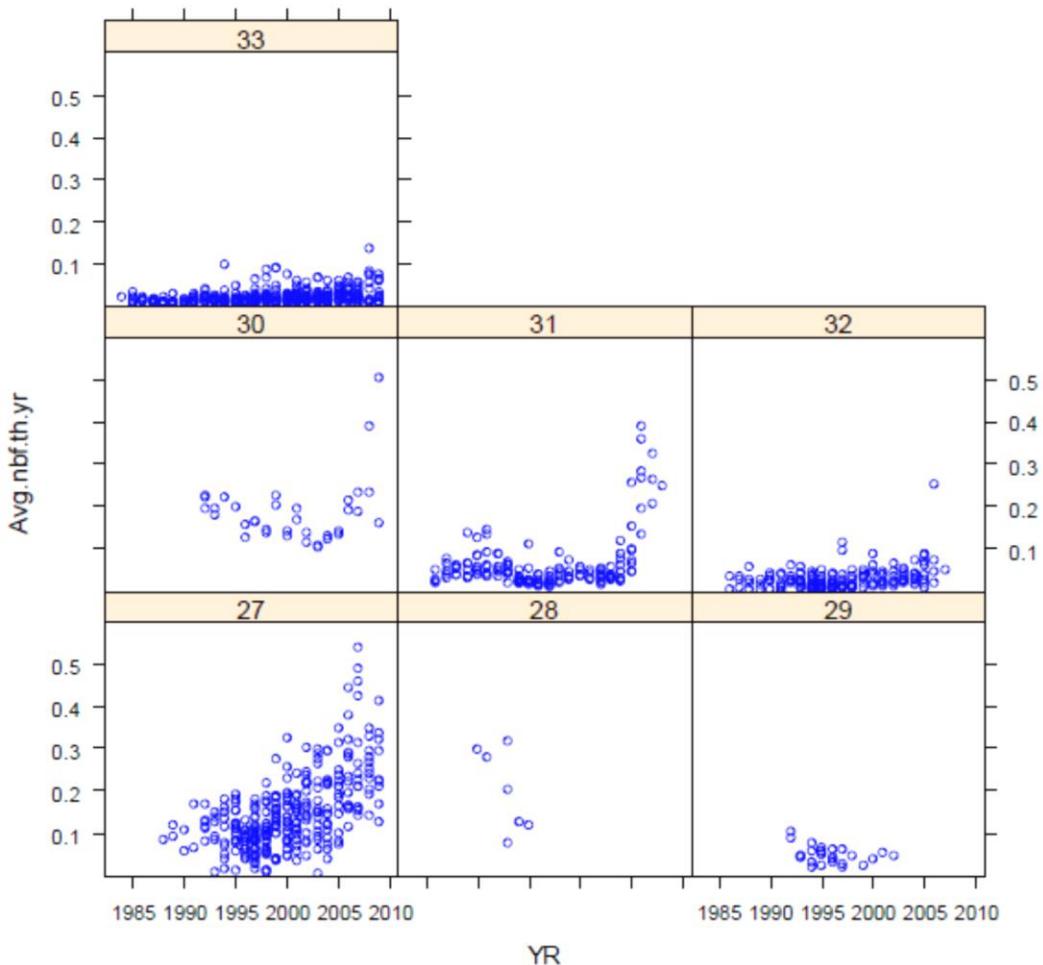


Figure 45. Plots of unstandardized CPUE data for berried females from voluntary logs. Each point represents the annual CPUE for an individual fisherman (total number of berried/total number of traps hauled).

Abundance of sub-legal lobsters

Abundance of sublegals overall increased with an upward trend in LFA 27 over the last decades (Figure 46). The CPUEs are currently above median for 1999-2007. 2008-2010 median = 2.65 > 1999-2007 median = 1.82.

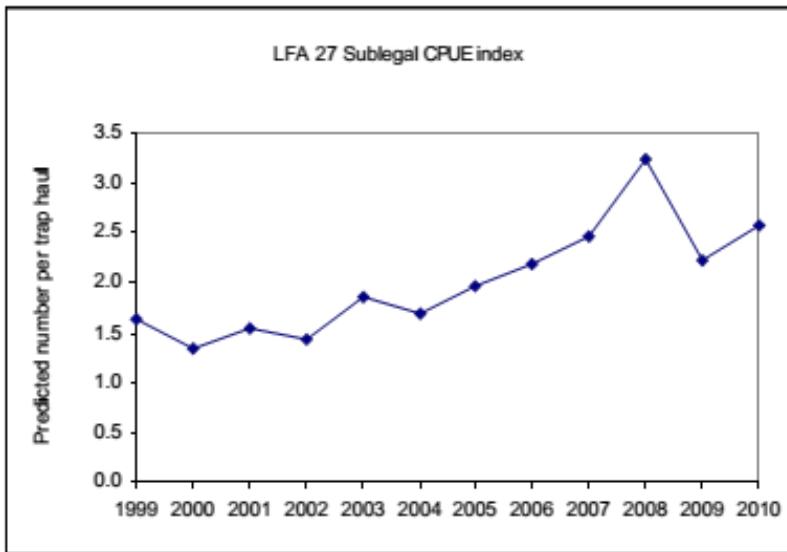


Figure 46. CPUE index of sublegals sizes for LFA 27 as a whole. Source: DFO 2011b.

The overall abundance of sublegals has shown a general upward trend in LFAs 28-32 in the period 2003-2007 (Figure 47). The 2008-2010 median for CPUEs weighed by landings was 2.27 compared to 1.83 for the period 2000-2007. For the CPUEs weighed by rocky shoreline length, the 2008-2010 median was 1.78, and 2003-2007 median was 1.69. There are some differences among LFAs. LFAs 29, 30 and 31A saw larger increases in recruits than LFA 31B, small increase was apparent in LFA 32.

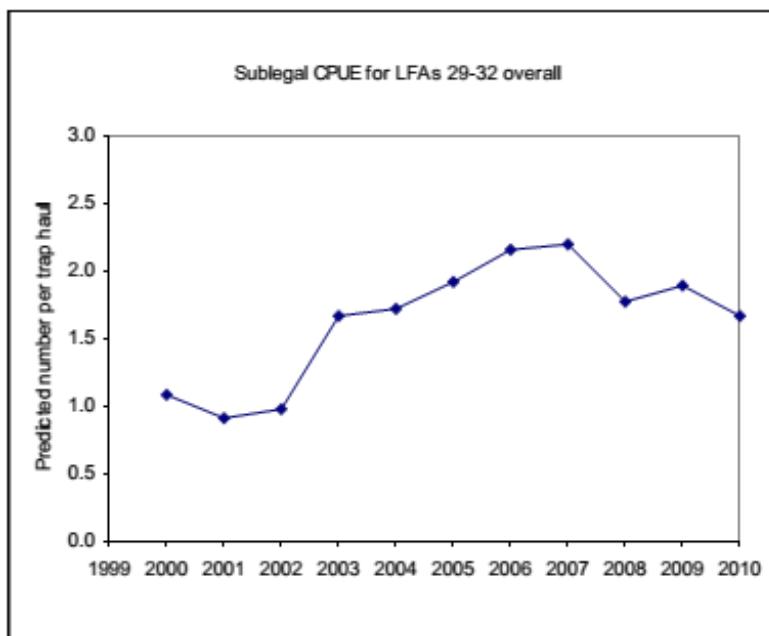


Figure 47. CPUE index of sublegals sizes for LFA 29-32 as a unit. Source: DFO 2011b.

The overall abundance of sublegals has trended upwards in LFA 33 as a whole (Figure 48). The 2008-2010 median CPUE was 2.80, and 2.43 for the period 1999-2007.

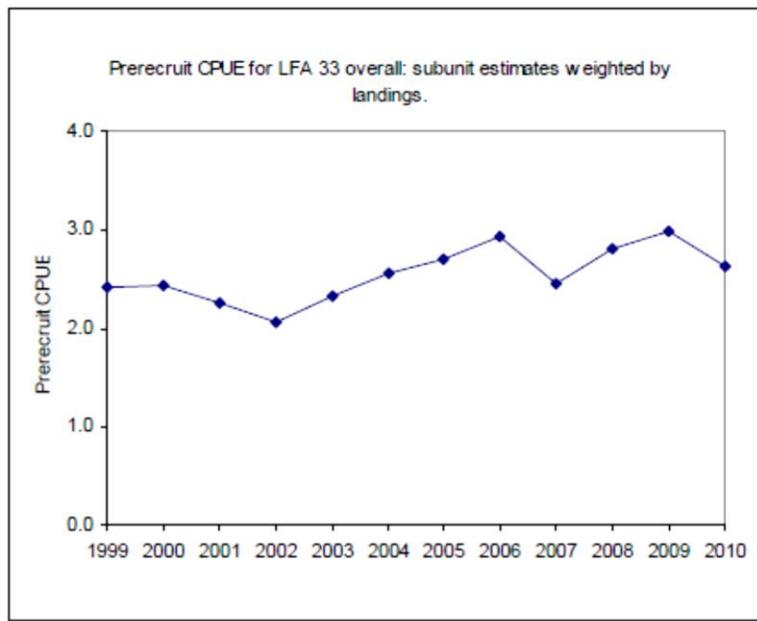


Figure 48. CPUE index of pre-recruits for LFA 33 overall as a subunit estimates weighted by landings.

Egg index

An egg index was calculated for LFA 31a (Figure 49). In the most recent years (2008-2010) there has been a dramatic increase in the overall number of eggs and proportion of the eggs originating from the smaller sizes. The proportion of eggs originating from sub legal sizes has increased even though the minimum legal size has decreased over this time. The increases observed are the result of a large recruitment pulse that began in 2005 and has seen landings increase five-fold. The numbers of lobsters and resultant eggs, from the window size females has remained relatively constant and represent a lower proportion than in 2002-03. It takes 5-7 years for newly recruited female lobsters to grow to the window size range so to date few of the animals from the recent recruitment pulse would have reached that size, however some increase would be expected as the window size was established prior to 2000.

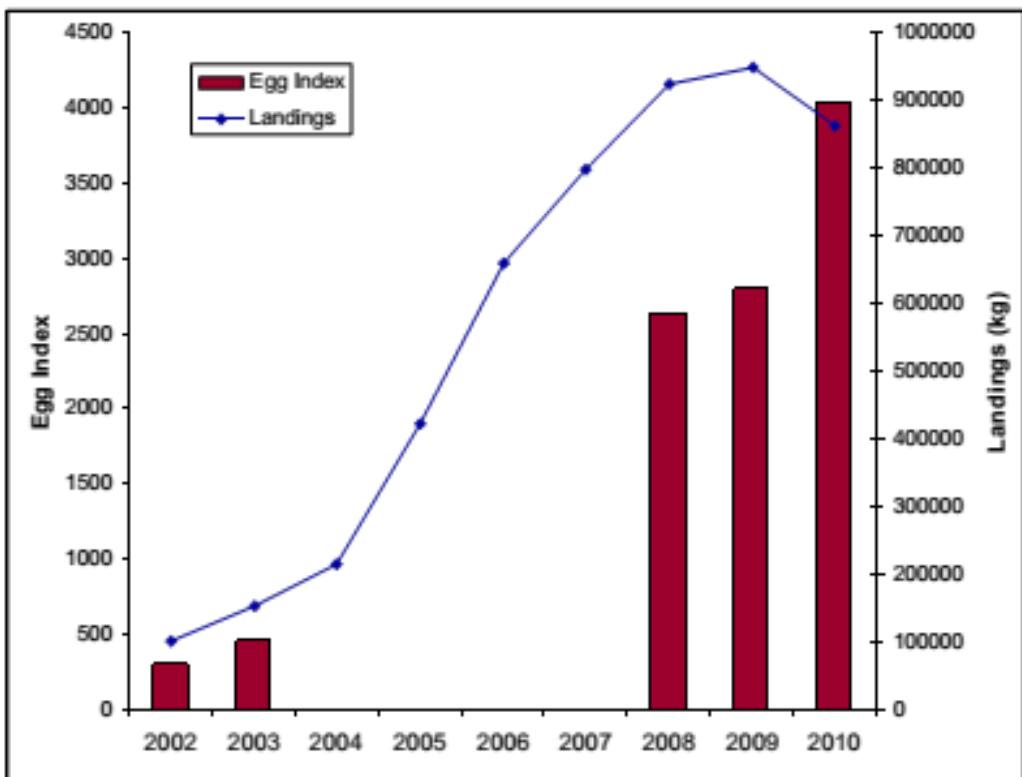


Figure 49. Egg index for LFA 31A in 2002, 2003, 2008-2010. Source: DFO 2011b.

4.3.2.3. Uncertainties (DFO 2011b)

Lobster landings data are available back to the 1890s. Landings are a function of abundance, level of fishing effort (trap hauls and soak days), timing of effort, fishing strategy and regulations, catchability (environmental, gear efficiency, density, and lobster movements), and the distribution of animals and effort. Variation in reporting levels also contributes to variation in landings. Thus, changes in landings are not a direct reflection of changes in abundance.

The main abundance trends for recent years for all assessment units come from CPUE during the fishery. There are no fishery independent data on abundance for LFAs 27-33. CPUE in FSRS traps are of value because they come from standard traps which are consistent from year to year, but even these are fished during the fishing season so are not truly fishery independent.

CPUEs are a function of abundance and catchability. Catchability is affected by environmental conditions, gear efficiency including trap design and bait, and other factors. Changes in any of these can affect catch rates. While one CPUE index presented does account for temperature, the bulk of the available CPUE time series do not account for any of the factors mentioned above.

Any changes in fishing efficiency (or “effective effort”) have not been accounted for. If fishing efficiency has increased over time due to larger vessels, better navigation or improved fishing strategy, then CPUEs (mean and modelled) will inflate our perception of abundance in recent years. The CPUE indices based

on FSRS traps usually trended in a manner similar to CPUE from voluntary logs, indicating that any changes in fishing efficiency in the last 10 years are not affecting our perception of abundance.

4.3.2.4. Reference Points

Egg production per recruit (EPR) reference points have formally been adopted in Canada (FRCC 1995, Fogarty and Gendron 2004). A goal of doubling EPR relative to 1995 levels has been adopted as a management target (FRCC 1995).

The IFMP (DFO 2011a) accepted to use the proxy of landings as the starting point. Some candidate interim thresholds for lobster fisheries have been developed based on landings (Table 35).

Currently landings in all LFAs are in the candidate healthy zone (80% of the median landings). Most LFAs are also above the median landings for 1985-2004. The exception is LFA 27, which is at the median level but is still 24% higher than the candidate upper reference point.

Table 35. Initial PA Reference Points based on Total Landings

Target Reference Point	Undefined for now. It is expected that median landings will only be used for a short period of time until an improved indicator is developed.
Upper Reference Point	Candidate: 80% of Median landings 1985-2004
Limit Reference Point	Candidate: 40% of median landings
Removal Reference Point	Exploitation rate in assessment (90 th percentile for period examined in last available assessment) (essentially a cap while details of requirements reviewed)

4.3.2.5. Harvest Strategy, Harvest Control Rules and Tools

The lobster fishery is managed by effort control (input fishery). The four most important measures in controlling effort are the limited entry of lobster fishing licences, an individual trap allocation, restrictions on gear characteristics, and a limited fishing season. In addition to those management measures, other measures were implemented to protect key components of the lobster population (Table 36). Lobster can only be retained if they comply with a MLS designed to allow a portion of females to reach sexual maturity before being harvesters. Egg-bearing and v-notched females must also be released.

In 1995, FRCC report indicated that most of the Atlantic lobster stocks were overexploited. The FRCC formulated objectives and recommended conservation measures. The two main objectives were to increase the egg production (eggs-per-recruit) and to reduce the exploitation rate and the effective fishing effort. Except for LFA 33, the MLS is around the size at 50% maturity.

The FRCC recommended that eggs-per-recruit be increased to five percent of an unexploited population for all LFAs. The Council recognized that the five percent target was somewhat arbitrary and that it is not possible to determine precisely the minimum value of eggs-per-recruit that would adequately reduce the risk of recruitment failure. Increasing the eggs-per-recruit was seen as a precautionary measure and was not offered as an absolute guarantee against lobster stock decreases or a sure path to an increase in

landings. In implementing the FRCC recommendations, DFO chose to modify the target to double eggs-per-recruit rather than aim for the five percent target suggested given the appreciable uncertainties in the estimates of eggs-per-recruit of an unexploited population.

The primary measure that led to the increase in the eggs-per-recruit was an increase in the MLS (Table 36). This MLS remained stable in LFA 31, as the fishermen have chosen to implement a window-size for females, and they agreed to v-notch 110 lb of females per season.

Table 36. Major changes in management regime for LFAs 27-33 from 1998 to 2007.

LFA	Carapace Length		Time Period Over Which Change Occurred	Other Management Measures
	Old Size (mm)	New Size (mm)		
27	70 76	76 81	(1999-2002) (2007-2009)	
28	81	84	1999	Trap limit reduced from 275-250
29	81	84	1999-2000	Maximum hoop size of 6" Trap limit reduced from 275-250
30	81	82.5	1999	Maximum size on females 135mm
31A	81 86 84	86 84 82.5	1998-2000 2004 2007	114-124 Window size for females (started 1998-2000)
31B	81 82.5 84	82.5 84 82.5	1998 1999 2000	110 lb females v-notched and returned (started 2000)
32	81	82.5	1999	110 lb of females v-notched and returned (started 2000)
33	81	82.5	1998	

* There is a possession restriction of V-notched lobsters in all LFAs except in LFA 27 and LFA 31A

The implementation of the ALSM program in 2009 helps Canada's lobster fishery to ensure its long-term sustainability and economic prosperity. To access funding, harvester associations had to submit an LFA-wide sustainability plan, first that would improve biological productivity, provide reliable reporting of landings and reduce ecosystem impacts. Upon approval of the sustainability plan by DFO, harvester associations within the LFA applied for the second stage of the program, by submitting a request to DFO for partial funding for specific projects, which mainly consisted of effort reduction through buyback (reducing the number of harvesters) or reduction of the number of traps.

4.3.3. Southwestern Scotian Shelf and Bay of Fundy (UoCs 3 and 4)

4.3.3.1. Stock Assessment (DFO 2013d, DFO 2013e and Tremblay et al 2013)

The UoC 3 is represented by the LFA 34, at the southern tip of Nova-Scotia, and the UoC 4 corresponds to the LFAs 35-38 (Figure 50).

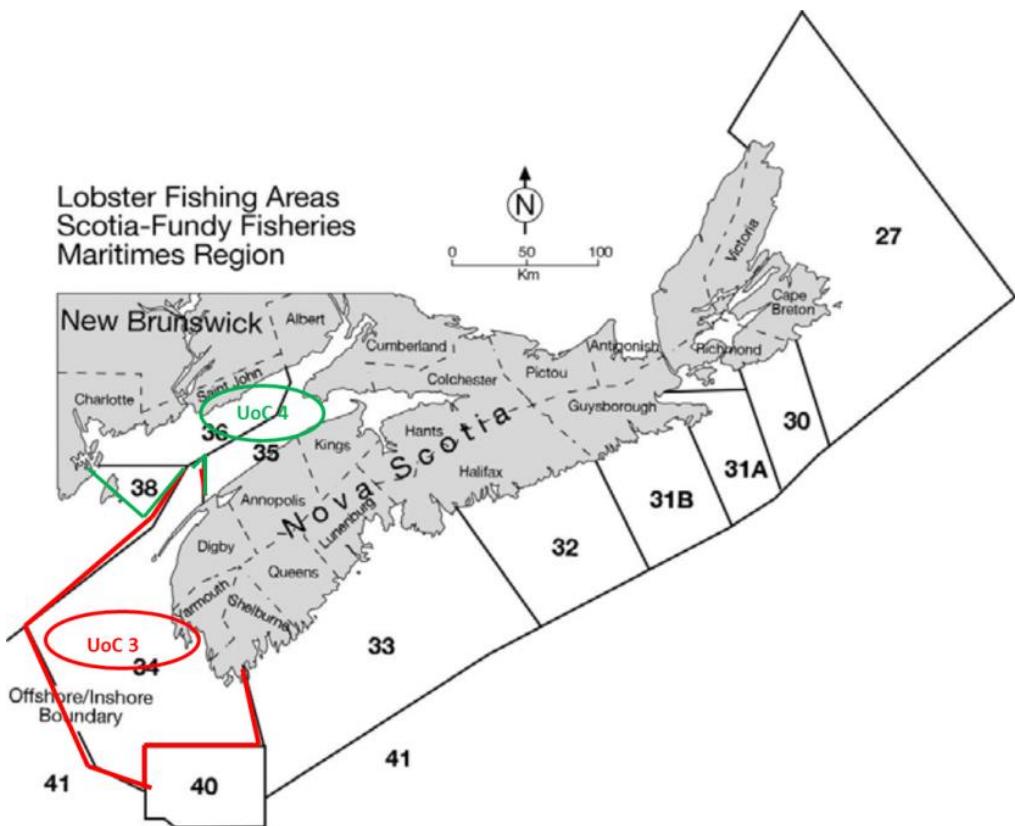


Figure 50. Map of lobster fishing areas (LFA) in Nova-Scotia with emphasis on UoCs 3 and 4. Source: Modified from Tremblay et al. 2011.

For assessment purpose, LFA 34 is divided into Grid Groups (GG from combinations of 10 minute grids in LFA 34 logbooks (Figure 51). GG 1, 2A-B corresponds to the inshore sector, GG 3, 4A-B to the mid-shore, and GG 5,6 to the offshore.

A similar subdivision into Grid Groups is also done for the Bay of Fundy (Figure 52).

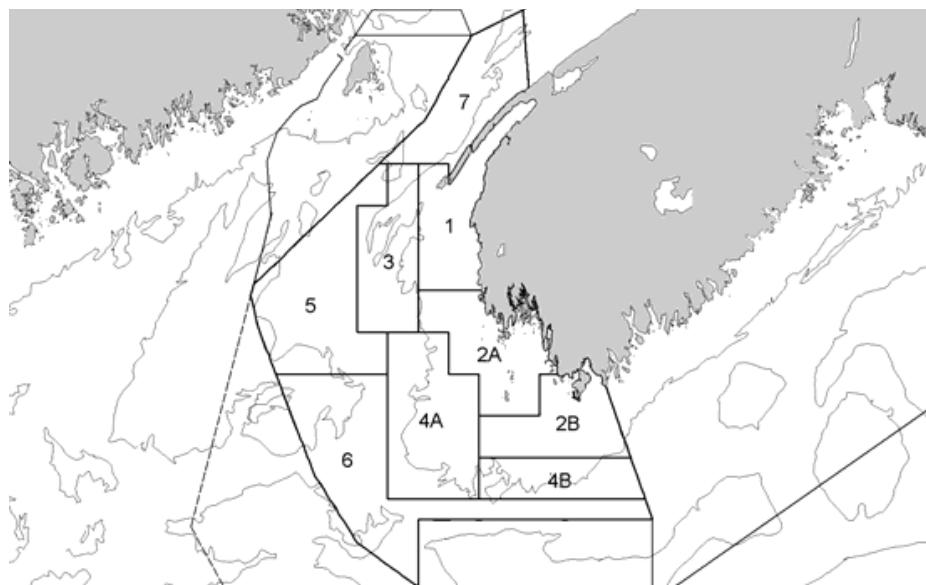


Figure 51. Grid Groups in LFA 34. Source: DFO 2013d.

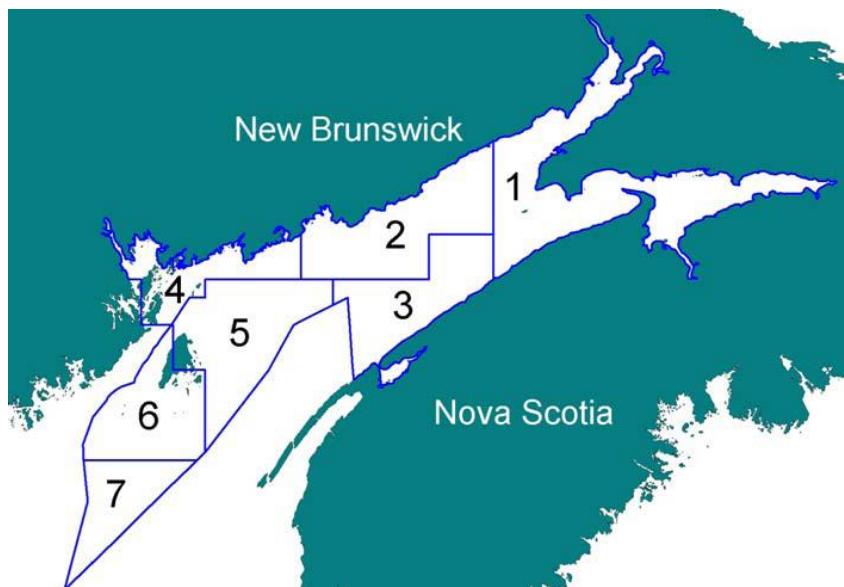


Figure 52. Grid Groups in LFA 35-38. Source: DFO 2013e.

There is no direct measurement of lobster biomass (empirical or analytical). The lobster stock assessment is based on the analysis of trends of stock indicators. They are fishery-dependent and fishery independent. Fishery dependent data consist of landings and effort data from the fishery, port and at-sea samples of the commercial catch and data from standard traps maintained by FSRS study participants. Landing levels are a function of abundance and a wide range of other factors but are still thought to be indicative of general trends and patterns of abundance. CPUEs are also affected by factors other than abundance. Fishery independent data are the regular summer DFO research survey, a trawl survey carried on by the industry ("ITQ survey"), and the scallop survey, which records lobster catches.

4.3.3.1.A. Fishery-dependent data

Landings statistics

All landings data prior to 1975 were obtained from a manuscript report. The data from 1975 to 1996 were obtained from Legacy Data Oracle tables by port and Lobster District. Data from 1997-2001 were obtained from the ZIFF (Zonal Interchange File Format) weigh out slip and estimate Oracle tables by Lobster District. Data from 2002 to present come from the current DFO MARFIS (Maritime Fishery Information System) Oracle database.

Changes in reporting systems in 1996 and 1998-2005 may influence accuracy and completeness of landings. Landings prior to 1996, based on sales slips, may have missed a portion of the catch sold directly to consumers or sold directly in the USA. The size of the underestimate is not known. Post 1996 landings, reported by fishermen directly, should be more complete; however, no analysis has been done to determine completeness or accuracy of reports. Thus, changes observed since 1996 must be viewed in light of the change in reporting methods.

With the Lobster Catch and Settlement Report, the most accurate landings data for an entire LFA are from the weigh out slip portion. The weigh out slip weight is the actual weight of lobster sold. This can provide landings only on a fishing season and LFA basis due to the uncertainty in the timing of when the lobster is landed versus when it is sold. As well, the only geographical information provided with a sale is the port landed.

When summarizing or analyzing landings on any finer temporal and spatial scale, the log portion of the report is used. The log includes a daily estimate of catch and effort by fishing location (a series of ten minute grid squares).

At-sea sampling

At-sea samples collect information from fishermen's catch during normal commercial fishing operations (Figure 53). The data collected includes: carapace length measured to the nearest millimetre (from the back of eye socket to the end of the carapace), sex, egg presence and stage, shell hardness, occurrence of culls and v-notches, and number, location and depth of traps. At-sea sampling provides detailed information on lobster size-structure in the traps (including sub-legal, berried, and soft-shelled lobsters). As all lobsters retained in each trap haul are measured, the numbers caught can be converted into estimates of the catch rate of legal-sized animals by weight from known length-weight relationships. Since 1988, all data is geo-referenced with latitude and longitude.

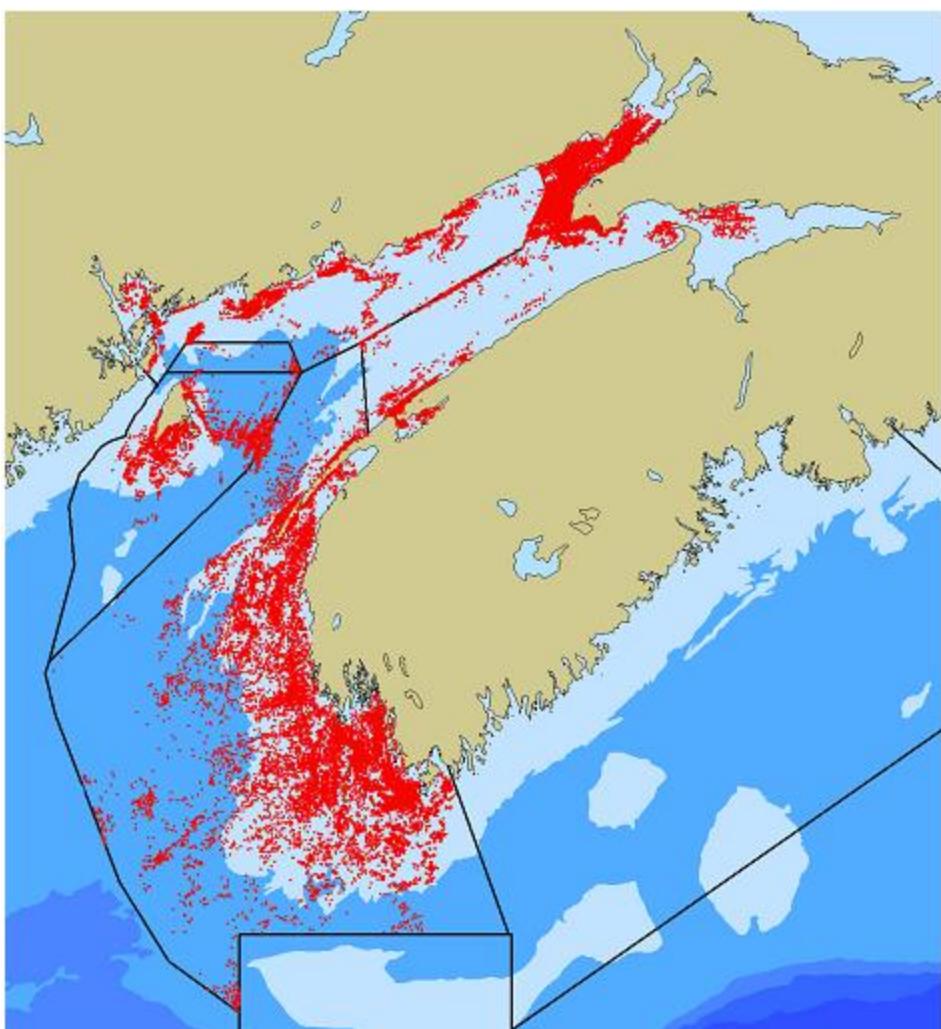


Figure 53. At-sea samples location, 1976 to present. Source: Tremblay et al 2013.

At-sea sampling provides detailed information on lobster size-structure in the traps (including sublegal, berried, and soft-shelled lobsters). As all lobsters retained in each trap haul are measured, the numbers caught can be converted into estimates of the catch rate of legal-sized animals by weight from known length-weight relationships. The number of samples is highly variable between fishing seasons (Figure 54 and Figure 55).

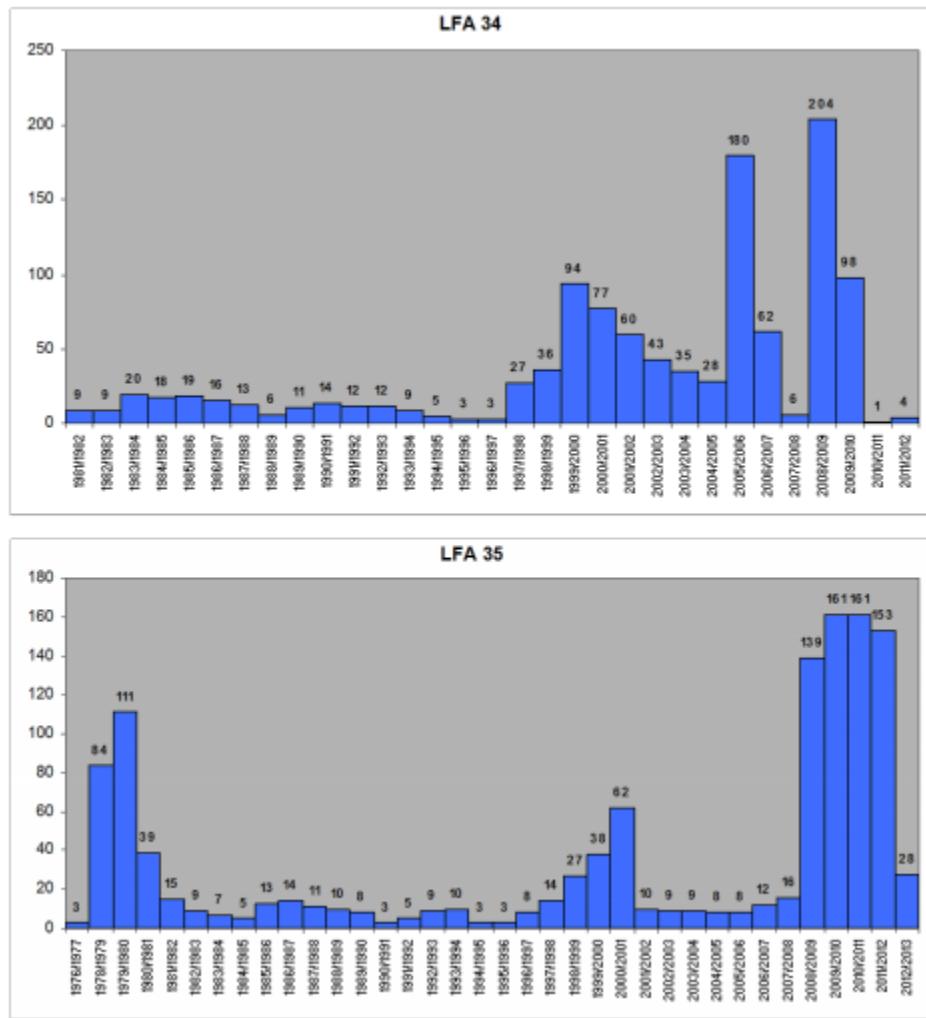


Figure 54. Number of at-sea samples per fishing season in LFA 34 and LFA 35. Source: Tremblay et al. 2013.

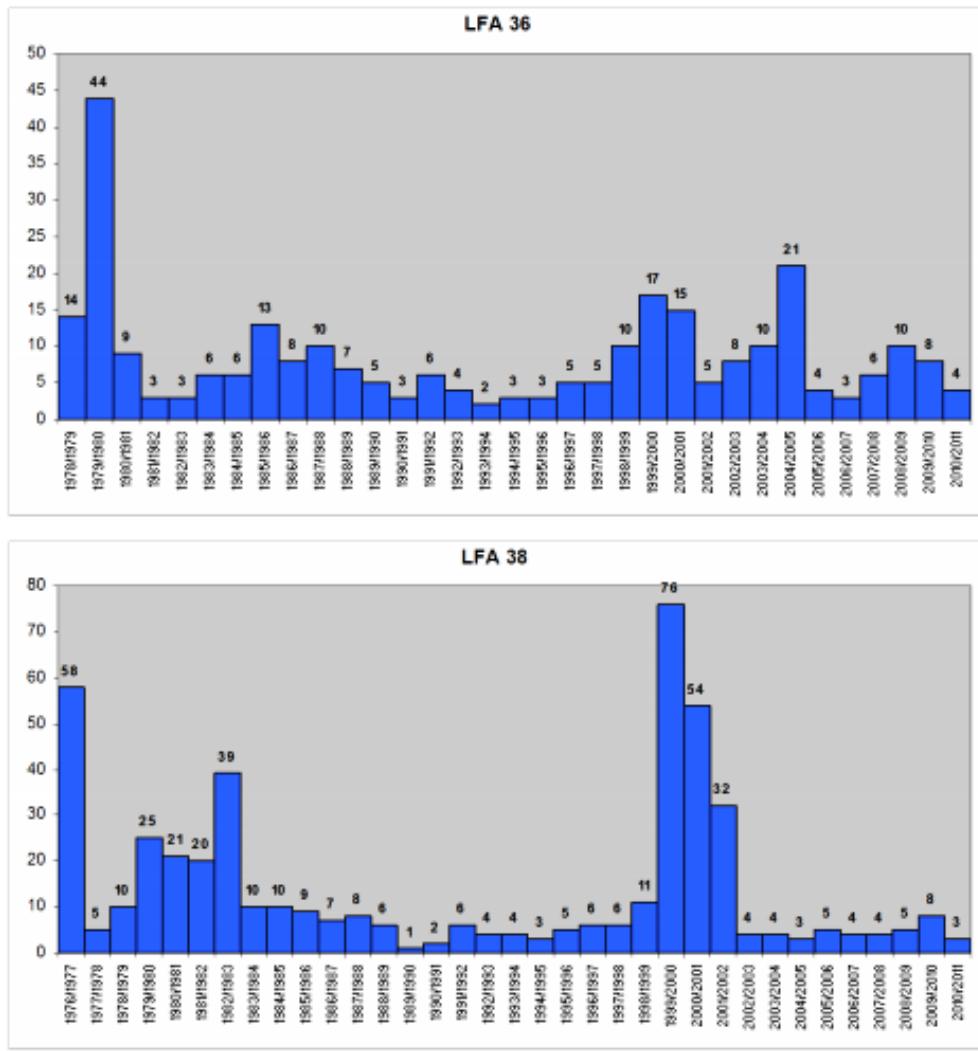


Figure 55. Number of at-sea samples per fishing season in LFA 36 and LFA 38. Source: Tremblay et al. 2013.

Port-Sampling

During port sampling, a fisherman's landed catch is measured (carapace length), and sexed. On average, each sample includes up to 6 crates of lobster, or the fisherman's catch for the day. This information is captured on a voice recorded and later transcribed onto paper for data entry into the LOBBIO database. In the past, location of the samples was available only at the level or port landed. However, in more recent years, whenever possible the fishing grid from the Lobster Catch and Settlement Report is associated with the sample. A summary of the numbers of port samples completed by year in LFA 34 is available in Table 37. Typically these samples were taken in both the fall and spring portions of the fishing seasons.

Table 37. Numbers of port samples by year For the LFA 34.

Year	No. Port Samples
2006	32
2007	37
2008	42
2009	38
2010	41
2011	41
2012	42

FSRS recruitment traps

The FSRS recruitment trap project involves volunteer fishermen keeping track of the lobsters caught in project traps. Fishermen participants use standard traps and a standard gauge to assign each lobster captured to a size group. Participants in the project are distributed along the Atlantic coast of Nova Scotia (Figure 56). The number of participants in LFAs 34 was 3 in 1998-99, but increased steadily to 49 in 2005-06. The number of participants was 25 in 2011-12 (Table 38). The number of participants in LFA 35 was 6 in 2006-07, and 13 in 2011-12 (Table 39).

Participants record size, sex and presence of external eggs for all lobsters collected in standard traps on each day of commercial fishing. Compared with commercial traps, the FSRS wire traps have features that lead to greater retention of pre-recruit lobsters: smaller mesh size (2.5 cm), smaller entrance rings (12.5 cm), and no slots to allow sublegal sized lobsters to escape. As such, the FSRS traps provide a better indication of the abundance of pre-recruit lobsters than commercial traps. Lobster measurements were made with an FSRS gauge that facilitates data collection in the field by fishers. Fishermen were asked to set the traps in one location throughout the season. The standard traps were equipped with temperature recorders that provided data on nearshore bottom.

Since the traps are the same throughout the study area, they allow for a better comparison between areas that may have several different designs of commercial traps. The data provided by that program could be considered, therefore, as “quasi fishery independent” data.



Figure 56. Locations of traps in FSRS recruitment trap project (as of spring 2012). Source: Tremblay et al 2013.

Table 38. Number of participants to the FSRS recruitment trap project in LFA 34.

Fishing season	Number of Participants
1998/1999	3
1999/2000	24
2000/2001	37
2001/2002	38
2002/2003	42
2003/2004	41
2004/2005	46
2005/2006	49
2006/2007	39
2007/2008	34
2008/2009	32
2009/2010	31
2010/2011	30
2011/2012	25

Table 39. Number of participants to the FSRS recruitment trap project in LFA 35.

Fishing season	Number of Participants
2006/2007	6
2007/2008	4
2008/2009	13
2009/2010	14
2010/2011	14
2011/2012	13

4.3.3.1.B. Fishery independent data

Fishery independent data sources for LFAs 34-38 include surveys directed at other species that routinely sample lobsters in addition to the targeted species. These include:

- DFOs ecosystem trawl survey, completed annually in summer since 1970.
- An industry trawl survey (the ITQ survey) designed to obtain information on the groundfish abundance. This survey began recording lobster in the first year of the survey (1995) and has recorded lobster sizes since 2005. The ITQ survey is a fixed station survey of approximately 180 stations that occurs at the same time each year.

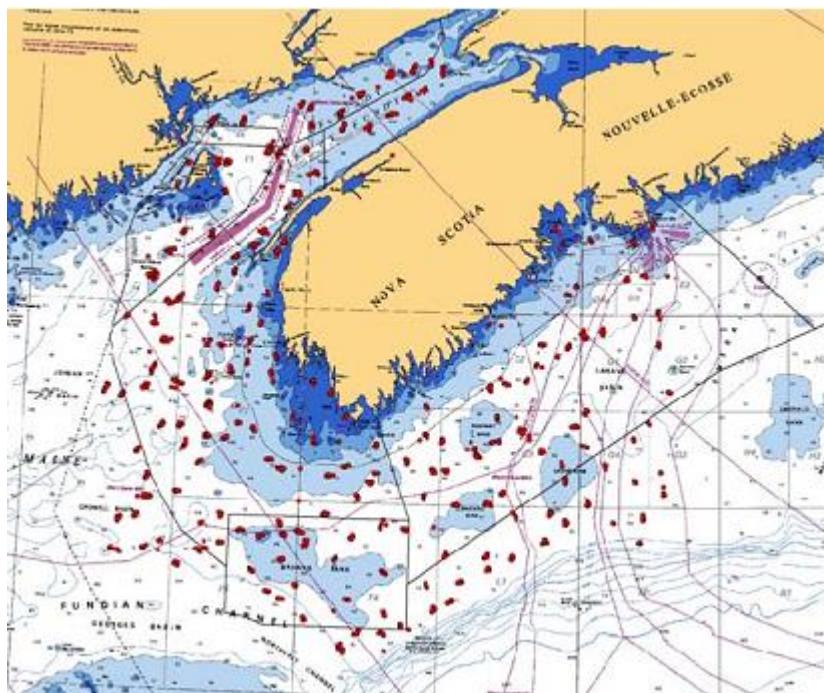


Figure 57. ITQ survey fixed station locations. Source: DFO 2013d.

- Annual scallop survey conducted since 2001. These surveys have more limited applications as fishery independent indicators of lobster abundance as they have changed in design (spatial coverage, timing) and have low catch rates of lobsters.

4.3.3.1.C. Determination of Indicators

The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production.

Abundance from fishery dependent data

Landings

Landings data are available from various sources since the 1890s, and they have been used historically as an indicator of the state of the fishery. However, landings levels are a function of abundance, level of fishing effort (trap hauls and Soak Over Days), timing of effort, fishing strategy, catchability (environmental, gear efficiency, density), and availability. Changes in any of these can affect landing levels. Thus, changes in landings are not a direct reflection of changes in abundance.

Major changes in effective effort occurred during the 1980s and 1990s that were brought on by changes in vessels, traps and ship board electronics (i.e. sounders, radar, Loran, Global Positioning System (GPS), mapping). These changes make comparison with older historical landings questionable. However, the long-time series available can give indications of general trends and patterns in abundance.

For the fishing seasons 1974-75 to 2011-12, landings within each year and LFA were characterized as within the lower quartile (lowest 25%), middle two quartiles (25-75%), or upper quartile (upper 25%).

Catch rates from commercial mandatory logbooks

CPUE (kg/trap haul) was calculated from those records that provided daily weight landed, (estimated) daily effort, and a grid. Annual CPUE for the spatial unit of interest was calculated simply as the total weight landed per year/total number of trap hauls per year.

Catch rates from FSRS logbooks

Data from FSRS traps may be the best source of catch rate data available for LFAs 27-33 in that they come from standard traps fished in fixed locations. They are not totally fishery-independent in that they are hauled only during the fishing season when project participants are tending their commercial gear.

In order to standardize CPUEs, a Generalized Additive Mixed Modeling (GAMM) was used to obtain catch rate estimates. In that model, fishing season year and week of the fishing season are fixed effects, and FSRS vessel (=fisherman) is treated as a random effect.

A second approach uses a Temperature Corrected Abundance Index (TCAI) probabilistic model of the catch from a single sampling event as a function of the number of lobsters available at the sampling location, the current temperature, and the catchability-temperature relationship.

The input data for the TCAI differs from standardized CPUE analysis in that soak days were restricted to one day, and the sizes examined were subsets of the total sublegals. FSRS sizes 7 to 9 and a portion of size class 10 were used in the model. Size classes 7 and 8 represent 61-70.9 mm and 71-75.9 mm CL; FSRS size class 9 represents 76-80.9 mm CL. The sublegal portion (81-82.4 mm CL) of FSRS size class 10 (81-90.9 mm CL) was also included.

Abundance from fishery independent data

The summer RV trawl survey is a source of fishery independent information on lobster. The survey has been conducted since 1970. However, nearshore areas (<50 m depth) where lobsters are most abundant are not sampled nor are large areas of LFA 34 and Bay of Fundy due to untrawlatable bottom. The index of abundance corresponds primarily to catch rates expressed in number/tow. The proportion of tows with lobsters translates the expansion and contraction in spatial range or in depths occupied by a species and can be an indicator of the changes in population size or shifts in distribution due to the environmental changes.

The ITQ survey mean number of lobster per tow is provided as a primary indicator of abundance for LFA 34 and as a secondary indicator of lobster abundance in the Bay of Fundy. This survey began recording lobsters in the first year of the survey (1995) and has recorded lobster sizes since 2005. The ITQ survey is a fixed station survey of approximately 180 stations that occurs at the same time each year. Between 2010 and 2012, 4,000-5,000 lobsters were measured annually during the survey. As for the RV survey, the index of abundance corresponds to catch rates expressed in number/tow.

Fishing pressure

Fishing effort

The Lobster Catch and Settlement Reports from LFA 34 and LFAs 35-38 were used to estimate (i) the annual number of trap hauls, (ii) the average number of days fished per fisherman, and (iii) the average number of grids fished per fisherman. The average number of days fished could be estimated from both versions of the Lobster Catch and Settlement Report, while annual trap hauls and grids fished could only be estimated from the version that includes daily effort.

Mean lobster size

As an indicator of fishery performance, size of lobster in commercial traps was estimated for the legal portion of the catch. The median sizes correspond to the 50th percentiles, and the largest ones to the 95th percentiles. For the LFAs 35-38 and 34, the time series starts in 1989.

Exploitation rate- Change in ratio

An index of exploitation rate (ER) was estimated using the Continuous Change in Ratio (CCIR) method, which utilizes the change over the course of the fishing season of the ratio between an unharvested size class (reference class) and a harvested size class in FSRS recruitment traps.

For LFA 34, exploitation rate was estimated for males and females for each year within Grid Groups 1, 2A and 2B and 4AB for the fishing seasons 1999-00 to 2011-12. The exploited size group was the minimum legal size (MLS, 82.5 mm) to 90 mm CL, the reference size group 76 mm CL to MLS.

For LFA 35, exploitation rate was estimated in the same manner as for LFA 34. Data were limited to the fishing seasons 2007-08 to 2011-12, and to two Bay of Fundy Grid Groups: Grid Group 1 in the upper Bay, and Grid Group 3 on the Nova Scotia side of the lower Bay.

Exploitation rate - Length Cohort Analysis

Length cohort analysis (LCA) is used to estimate exploitation rate in LFA 34. The method assumes that abundance at the end of year i can be estimated by the initial abundance, a half year of natural mortality, a midyear catch, and natural mortality for the remainder of the year.

The size distribution used for the method is that of the landed catch. This was developed from available at-sea samples, but as the method requires, only the legal sizes and legally retained animals were

included. This size distribution was used to estimate the catch for the sequence of time intervals and von Bertalanffy growth parameters were applied to estimate the delta t (time duration of each size interval). Since this method does not follow a single cohort over time, but instead assumes that the size frequency represents the abundance of a cohort over time, the method assumes constant recruitment. In practice, however, this is not the case and estimates are generally based on the size distribution aggregated over several years.

The analysis was done on the weighted catch at size for the season 2000-01, 2003-04, 2006-07 and 2009-10. The size frequencies for the above seasons were based primarily on sizes measured during the above season, but where Grid Groups were not sampled in that season, seasons before or after were used to fill in the gaps.

Production

Abundance of sub-legal lobsters

Catch rates in the FSRS recruitment traps were used to analyse the trends in abundance of sub-legal lobsters. The treatment is the same as for the legal size lobsters.

Data are only available for LFA 34.

Egg index

An egg production index was calculated. An estimate provides the potential egg production, derived from the maturity ogive. Another estimate calculates the observed egg production from catch rates and fecundity-at-size of ovigerous females.

4.3.3.2. Stock Status (DFO 2013d, DFO 2013e and Tremblay et al 2013)

4.3.3.2.A. UoC 3

Abundance

Landings

Commercial lobster fishing began in the mid-1800s and annual lobster landings in the Gulf of Maine were first recorded in 1893. Landings peaked in 1898 at 15,995 metric tons (t), and were followed by a decline in landings, dropping to 1,600 t in the early 1930s (Figure 58). The landings remained low (1,600-3,000 t) during the 1930s and early 1940s. Landings rose following World War II (WW II), varying between 2,200 and 4,500 t (averaging 3,334 t) until the 1980s. Landings increased throughout the 1980s as part of a pattern that extended over the entire range of the lobster in the western Atlantic.

Current and recent landings are very high by any measure. They are 2.6 times the 50-year mean (1961-2010), and the last three years are the highest on record. Considering the period from 1975-76 to 2011-12, eight of the last ten years are in the upper quartile, the other two years were in the 3rd quartile.

Within the LFA 34 Grid Groups, spatial shifts in landings are evident (Figure 59). Most Grid Groups have trended upwards, but Grid Group 2A (Lobster Bay area) has trended downward since 2001-02. Landings in Grid Groups 2B and 4B have increased.

Considered from the perspective of nearshore (Grid Groups 1, 2A, 2B, 7), midshore (Grid Groups 3, 4A, 4B) and offshore (Grid Groups 5,6) the importance of the midshore and offshore has increased substantially. Landings in the nearshore Grid Group still comprise the bulk of the landings (63%), but have increased by a factor of just 1.2 since the first two seasons on record (1998-99 and 1999-00).

Increases relative to the first two seasons were much greater in the midshore (4.6) and the offshore (5.8).

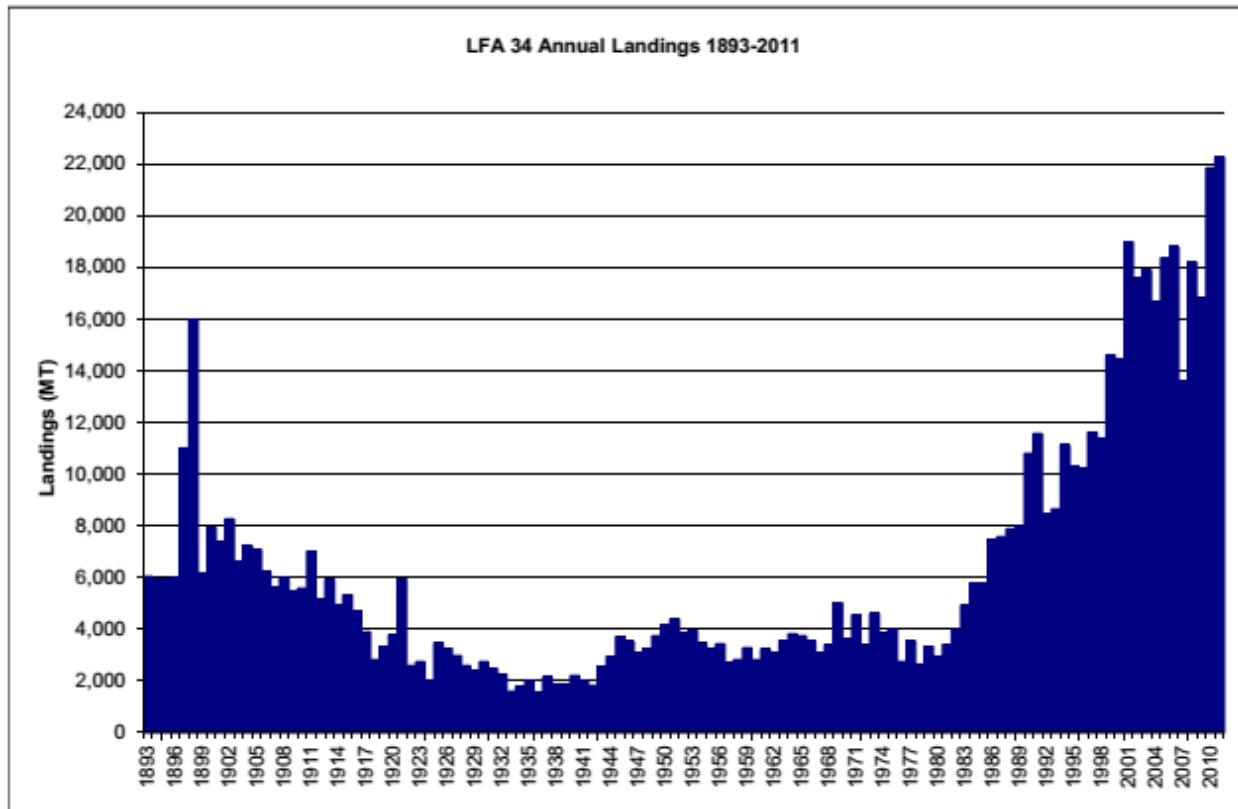


Figure 58. Annual lobster landings by the commercial fishery in LFA 34, 1893 to 2011. Source: Tremblay et al 2013.

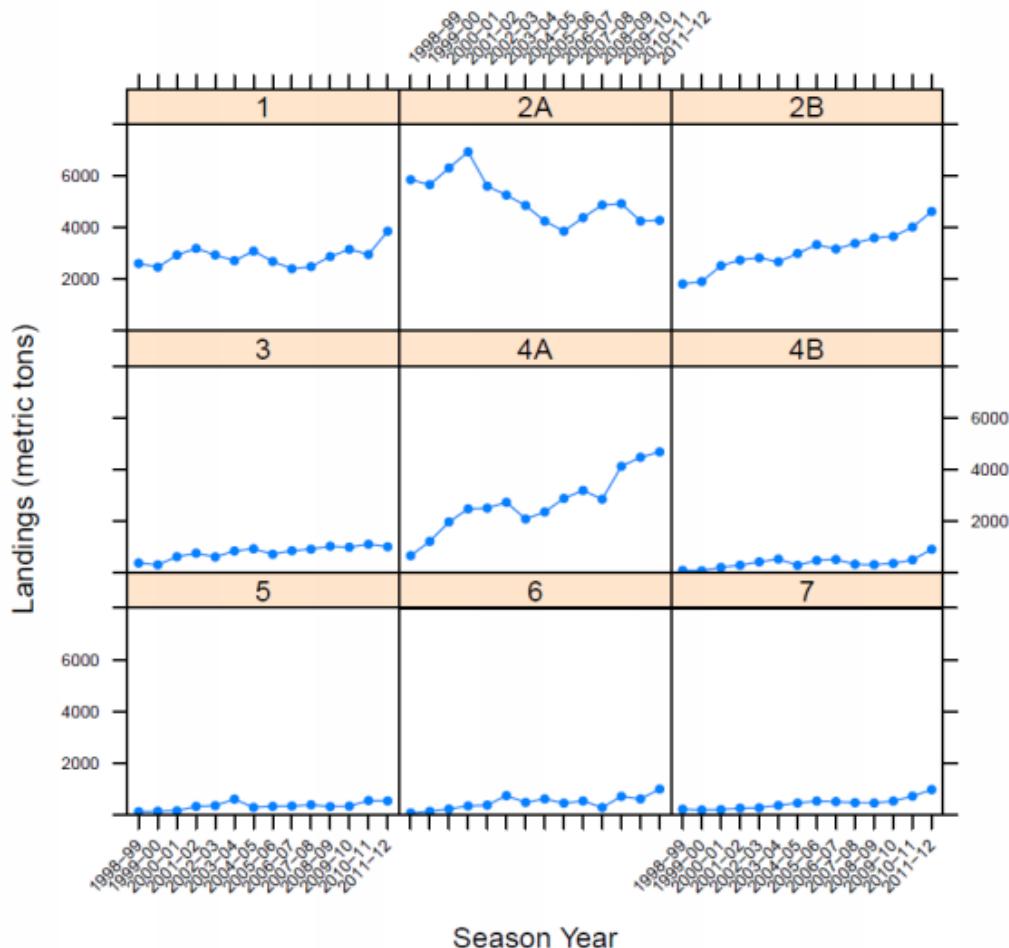


Figure 59. LFA 34 landings (mt) for 1998-99 to 2011-12 fishing seasons by Grid Group. Data are from the estimate portion of lobster catch and settlement reports. Source: Tremblay et al 2013.

Catch rates from commercial logbooks

CPUE in LFA 34 as a whole was lowest from 1998-99 to 2000-01 (0.6-0.7 kg/trap/haul), intermediate from 2001-02 to 2007-08, and highest for the last 3 years (0.9-1.1 kg/trap haul) (Figure 60). The average CPUE of the last two years (1.1 kg/trap haul) is 1.7 times that of 1998-99 and 1999-00. This increase in CPUE accounts for the increased landings over the same time period.

Within the LFA 34 Grid Groups, there was a general increase in CPUE in all Grid Groups, particularly in the last 3-5 years (Figure 61). The relative increase in CPUE was highest in the midshore and offshore Grid Groups. In terms of absolute values, the CPUE has been higher in the midshore and offshore Grid Groups throughout the time period.

The higher CPUEs in the midshore and offshore portions of LFA 34 provide an explanation for the shift in effort away from the nearshore Grid Groups.

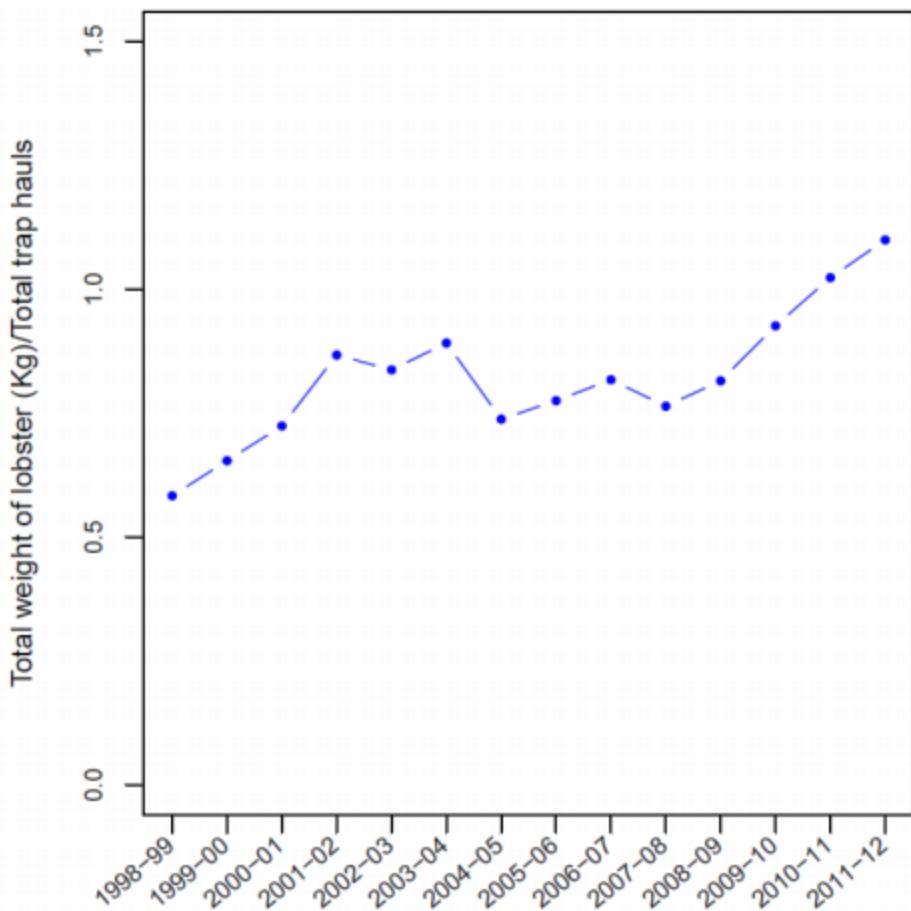


Figure 60. CPUE in LFA 34 as a whole for fishing seasons 1998-99 to 2011-12. Source: Tremblay et al 2013.

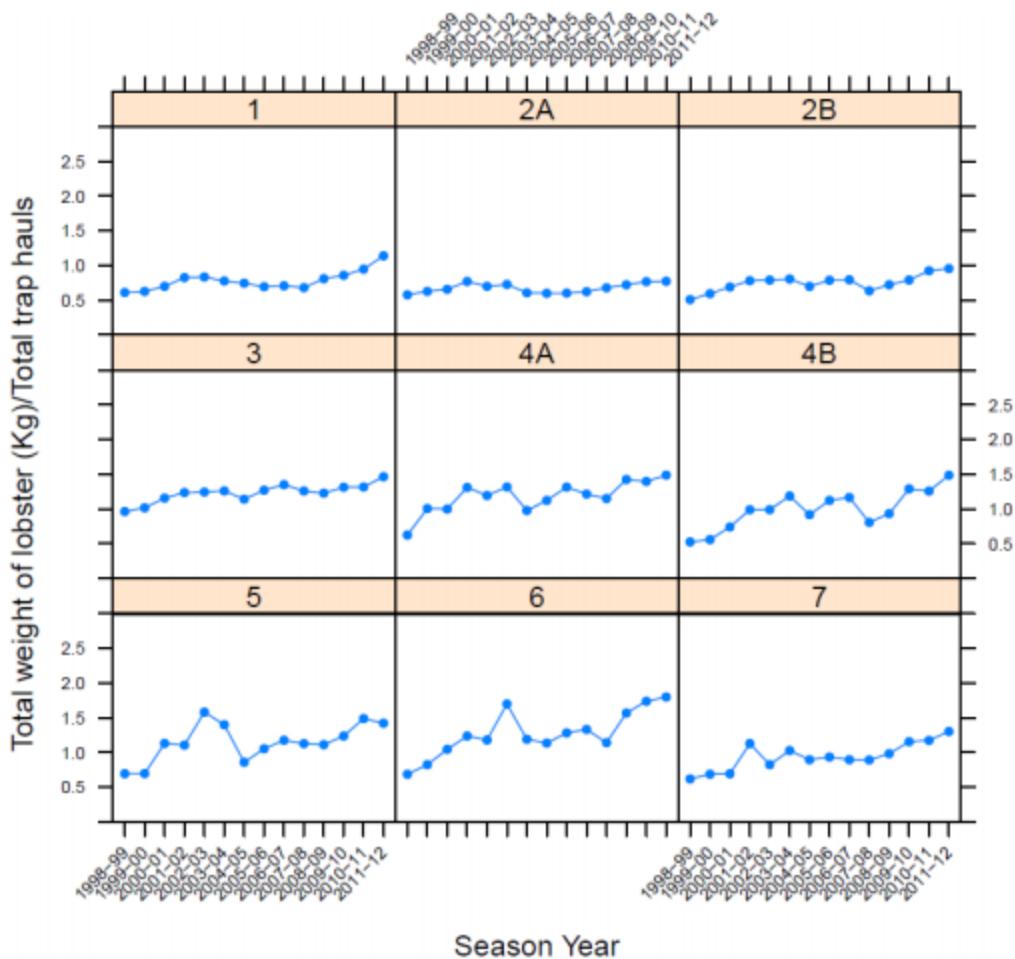


Figure 61. Commercial CPUE in LFA 34 by Grid Group for fishing seasons 1998-99 to 2011-12. Source: Tremblay et al 2013.

Fishery Independent Surveys

The increasing trend in the summer RV survey number of lobsters per tow in the Eastern Gulf of Maine area (Browns Bank, Gulf of Maine and Bay of Fundy) is consistent with the increasing trend in lobster landings in LFA 34 (Figure 62).

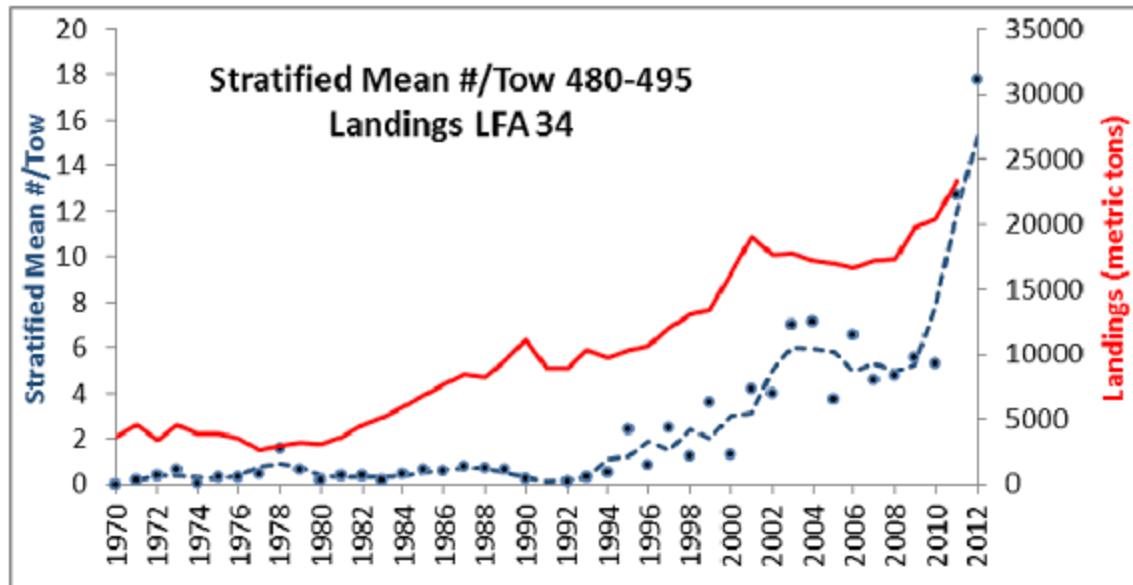


Figure 62. Stratified mean number of lobster per tow (3-year moving average) for Eastern Gulf of Maine (strata 480-495) (blue dotted line), and lobster landings (red solid line) for LFA 34 (1970-2012). Source: DFO 2013d.

The mean number of lobster per tow in the ITQ survey in LFA 34 has increased since 2000, with the highest values in the past 3 years (Figure 63).

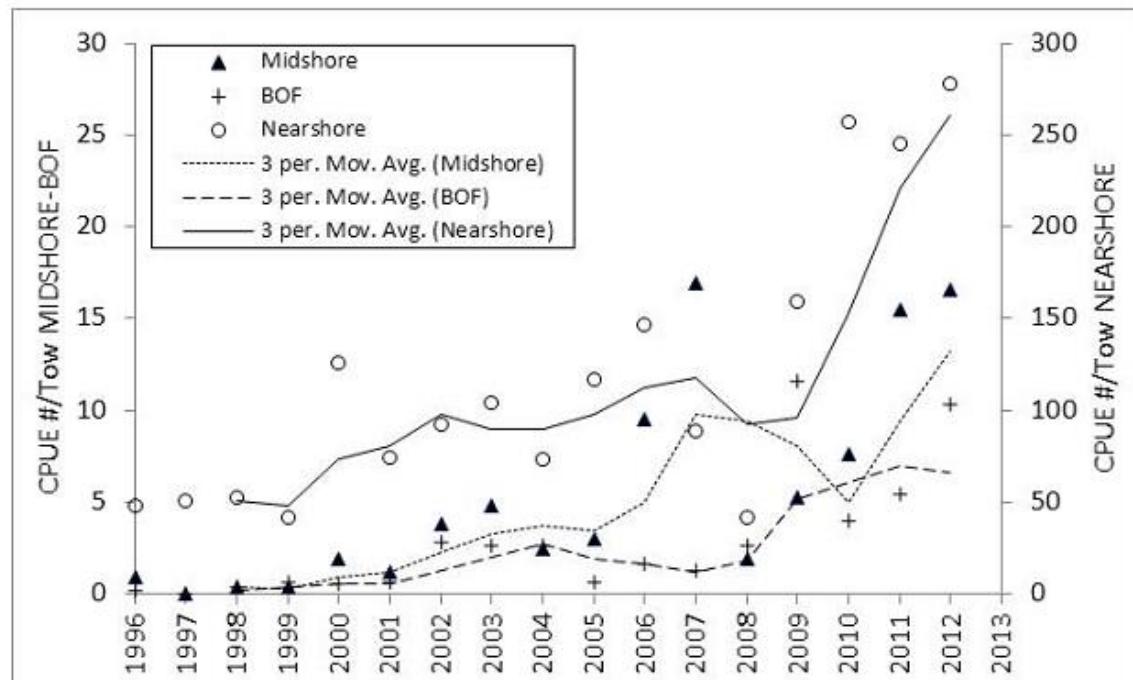


Figure 63. ITQ survey mean number of lobsters per tow and the 3-year moving averages for the midshore, the Bay of Fundy portion of LFA 34 (BOF; Grid Group 7), and the nearshore. Note that scale ranges from 0-300 for nearshore, and 0-30 for midshore and BOF. Offshore not shown (similar trend but always < 5 lobsters per tow).

There is good correspondence between the trends in the ITQ mean number of lobster per tow, fishery landings and commercial CPUE in LFA 34, with the exception of the nearshore where landings are decoupled from the ITQ index. This is likely due to the shift in the fishing effort from nearshore to midshore. Catch rates are much higher in the nearshore, as compared to the midshore/offshore (Figure 63), with a mean of over 240 lobsters per tow in each of the last 3 years, compared to 8-15 lobsters per tow in the midshore and less than 5 in the offshore.

Scallop survey catch rates of lobsters show trends similar to the summer RV and ITQ surveys where comparisons are possible.

To summarize, the summer RV and the ITQ survey number of lobsters per tow have both increased since 1996. There has been an expansion of the area with lobster catches in the surveys, which suggests a widespread increase in abundance.

Fishing pressure

Fishing effort

The total annual trap hauls reported for LFA 34 (Figure 64) shows no trend over the period since the Lobster Catch and Settlement Reports were introduced (1997-98). If anything, there is a declining trend in the adjusted effort since 2007-08. In terms of average days fished, there is a downward trend since 1997-98. In terms of the average number of grids fished, there is slight downward trend in the seasonal measure; the average per day was slightly higher in the last 5 years (1.17-1.22) compared to the first 9 years (1.10-1.16). It is concluded that total fishing effort in LFA 34 as measured by these indicators has not increased over the last 14 years.

Within the LFA 34 Grid Groups, there have been spatial shifts in effort that explain the spatial shift in landings (Figure 65). Effort within Grid Group 2A has declined, whereas effort in all other Grid Groups has increased or remained stable. In terms of nearshore, midshore, and offshore portions of LFA 34, effort in the nearshore portion of LFA 34 in the last two years is about 80% that of the 1998-99 and 1999-00 seasons. Effort in the midshore and offshore has increased by 2.7 times over the same time period. Most of the fishing effort (73%) is still in the nearshore.

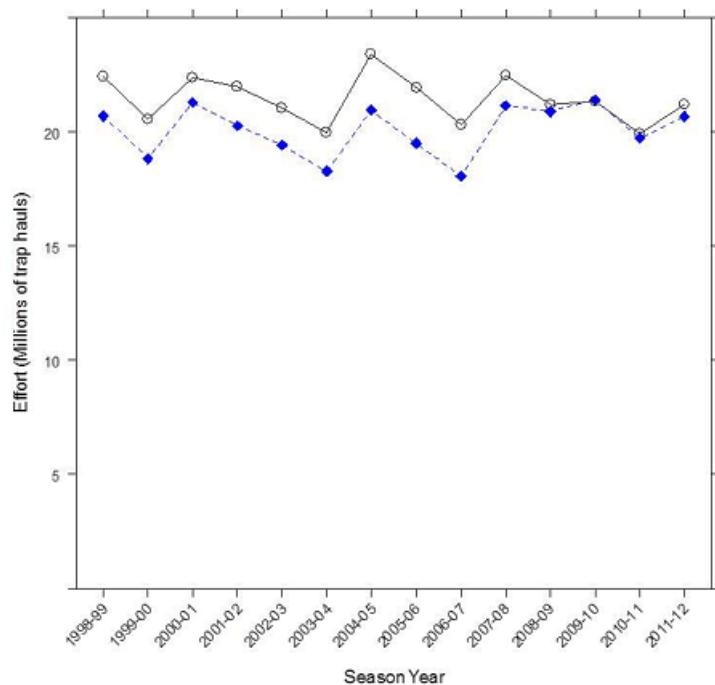


Figure 64. Annual fishing effort in LFA 34 for fishing seasons 1998-99 to 2011-12 in terms of total annual trap hauls (in millions). Data are from the estimate portion of Lobster Catch and Settlement Reports. Blue dashed line is total from logs; solid line is adjusted effort (weightless slip landings/CPUE). Source: Tremblay et al 2013.

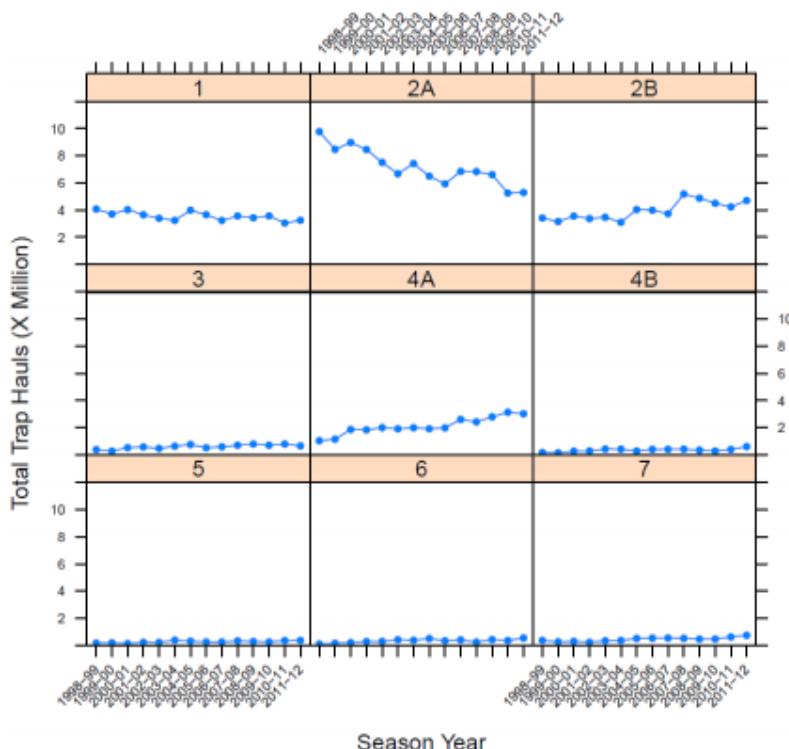


Figure 65. LFA 34 effort (number of trap hauls) by Grid Group for fishing seasons 1998-99 to 2011-12. Data are from the estimate portion of Lobster Catch and Settlement Reports. Source: Tremblay et al 2013.

Exploitation rate (ER)

Change in ratio

The results for LFA 34 Grid Groups are summarized in Table 40. By Grid Groups the means for 2006-2012 (males and females averaged within year) were 0.87 (GG1), 0.92 (GG2A), 0.80 (GG2B) and 0.87 (GG4AB). The means for 2000-2005 were lower in GG1 (0.79) and GG2A (0.86). Recent estimates are in the upper quartile for the times series for 2 of the 4 Grid Groups, but there was considerable inter-annual variability over the 13 year time series.

Table 40. Summary of CCIR exploitation rates for LFA 34 Grid Groups 1, 2A, 2B and 4AB. Shown for each year is the mean of male and female estimates. Each cell is coloured depending on whether it is below the 25th percentile (white), between the 25th and 75th percentiles (grey) or above the 75th percentile (black).

	1	2A	2B	4AB
2000	0.90	0.81	0.80	NA
2001	0.67	0.76	0.79	NA
2002	0.85	0.89	0.83	NA
2003	0.71	0.92	0.71	NA
2004	NA	NA	NA	NA
2005	0.82	0.90	0.82	0.861
2006	0.88	0.93	0.63	0.778
2007	0.89	0.89	0.94	0.91
2008	0.73	0.96	0.79	0.873
2009	0.90	0.92	0.72	0.821
2010	0.91	0.91	0.81	0.86
2011	0.91	0.90	0.74	NA
2012	0.87	0.95	0.81	0.88
25 th percentile	0.80	0.89	0.74	0.84
75 th percentile	0.89	0.93	0.82	0.88
Mean 2000-2005	0.79	0.86	0.79	0.86
Mean 2006-2012	0.87	0.92	0.80	0.87

Length cohort analysis (LCA)

The LCA results for the four seasons in LFA 34 are shown in Table 41. Size data were available for the whole of LFA 34, so estimates were done by nearshore, midshore and offshore. The results indicate differences between males and females and between nearshore, midshore and offshore, but there is no indication from LCA of an increase in exploitation rate over the time period considered. Estimates of exploitation were highest in the nearshore (females=0.84), almost as high in the midshore (females=0.76-0.80) and lowest in the offshore (0.47-0.49). For LFA 34, the overall estimates were 0.80

for females. A truncated size distribution observed in the nearshore for decades suggests that exploitation rates have been high nearshore for many years.

Table 41. Female lobster exploitation rate estimates from Length Composition Analysis (LCA) for LFA 34. Nearshore includes Grid Groups 1, 2A, 2B and 7; Midshore includes Grid Groups 3, 4A and 4B; Offshore includes Grid groups 5 and 6.

Fishing Season	Nearshore	Midshore	Offshore	All of LFA 34
2000-01	0.83	0.79	0.47	0.81
2003-04	0.85	0.81	0.47	0.79
2006-07	0.85	0.84	0.44	0.83
2009-10	0.84	0.67	0.54	0.77
Mean 2006-10	0.84	0.80	0.47	0.80
Mean 2000-04	0.85	0.76	0.49	0.80

To summarize, exploitation rates in LFA 34 overall (0.8 for females) have not increased since 2000-01, but are high relative to other lobster assessment areas and may have increased relative to the early 1990s. There is mixed evidence for increased exploitation in the nearshore in the last 10-12 years; CCIR indicates an increase in two nearshore Grid Groups, while LCA indicates no increase. Exploitation rates are highest in the nearshore (0.8 to 0.9 for females) and appear to have been high for many years; exploitation rate is lower in the offshore portion of LFA 34 (0.49 for females) and has not increased since 2000-01.

Size structure

As an indicator of fishery performance, size of lobster in commercial traps was estimated for the legal portion of the catch. Considering available at-sea samples from 1989 to the present, the 50th percentiles (median) of female size have trended downward in some nearshore (Grid Group 2B) and midshore areas (Grid Group 3, 4A). There were downward trends in the sizes of the largest females (95th percentiles) in some nearshore (Grid Group 2B) and the midshore (Grid Group 3, 4A) (Figure 66). Declines in the offshore (Grid Group 5, 6) were not evident and, in fact, there were upward trends. Another source of data for sizes in the commercial catch are the port samples in LFA 34. These are available only beginning in the 2005-06 season. The 95th percentiles of female sizes for port samples from catches in the nearshore, midshore and offshore were highest in the first year (2005- 06), with little subsequent trend.

To summarize, downward shifts in size structure were evident for some areas in the nearshore and midshore. There was no indication of a downward shift in the offshore.

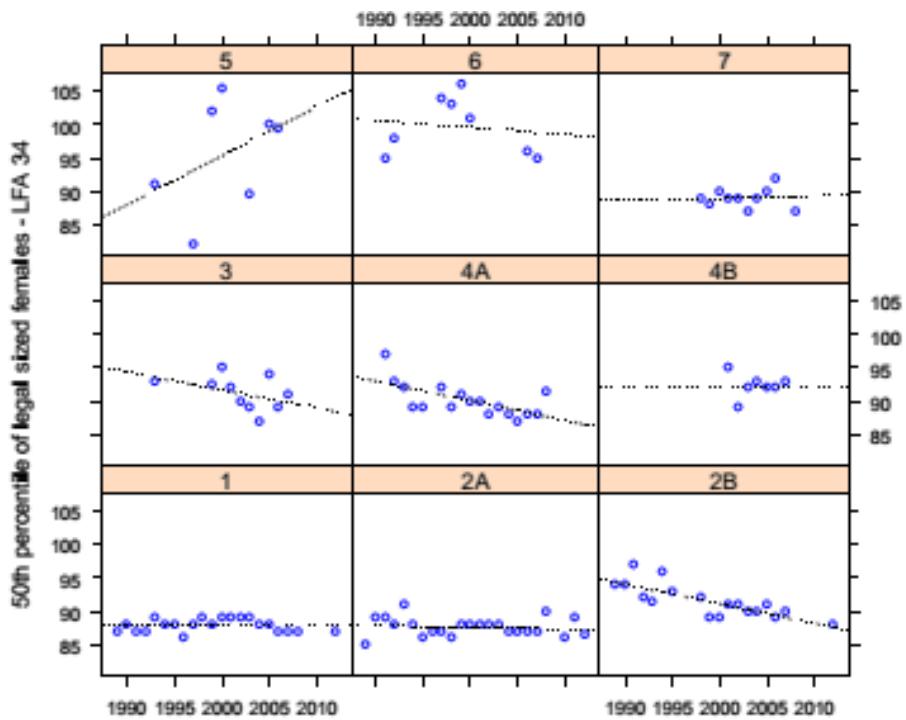


Figure 66. Trend in large female size lobster from the legal (≥ 82.5 mm) portion of at-sea samples in LFA 34 Grid Groups, 1989-2012. The 95th percentile by year is shown. Ovigerous females are excluded. The Dotted line is the linear fit. Subpanel labels are comprised of the LFA (first two digits) and Bay of Fundy Grid Group (last digit). Source: DFO 2013d.

Production

Abundance of sub-legal lobsters

Trends in the standardized CPUE for individual Grid Groups, and for a single index weighted by Grid Group (weighted standardized CPUE), indicate increases in sublegal abundance over the last 1-3 years. The weighted standardized CPUE indicates that CPUE in the nearshore of LFA 34 has been higher in the last 3 seasons (2009-10, 2010-11 and 2011-12) than the average of the previous 10 seasons (Figure 67)

The TCAI index indicates the abundance of sublegal lobsters has been higher in the last two seasons (2010-11 and 2011-12) compared to the average of the previous 11 seasons.

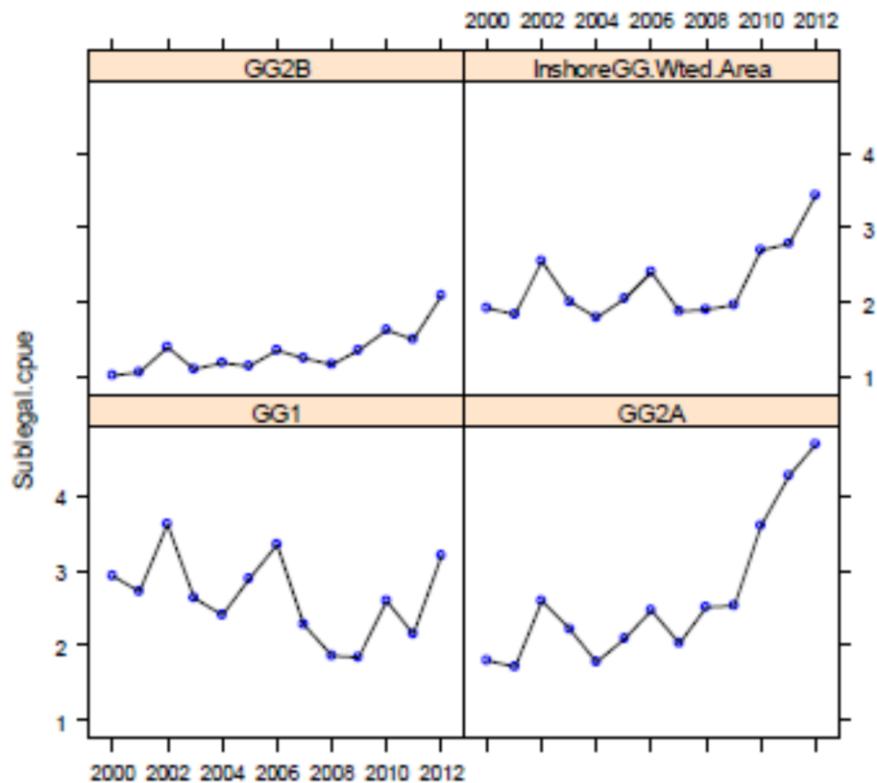


Figure 67. Model predictions of sublegal lobster CPUE in Grid Group (GG) 1, 2A and 2B from a Generalized Additive Mixed Model. “InshoreGG.Wted.Area” plot is a single index based on weighting the predictions for individual GG by their area.

Egg index

Size at onset of 50% maturity (SOM50) for 2011 was estimated at 96.5 mm CL in Lobster Bay (GG 2A). Only a small portion of females below the minimum legal size reach maturity. Despite increases in lobster abundance, the potential and observed egg production indices for subareas of the nearshore and midshore (Grid Groups 4A and 2A) for the most recent time period showed no increase relative to the 1990-1995 time period (Figure 68). In Grid Group 4A, the size category that contributed the most to the reproductive potential shifted down from medium size (100-120 mm CL) to lobster smaller than 100 mm CL. In Grid Group 2A, the medium size was also the biggest contributor to reproductive potential and observed egg contribution historically, but its contribution was substantially lower for the most recent period. In the adjacent Bay of Fundy, it has been shown that contribution to egg production from smaller mature females may be disproportionately low because of lower mating success. Those results reinforce the importance of larger individuals (i.e. larger than SOM50) for maintaining healthy broodstock.

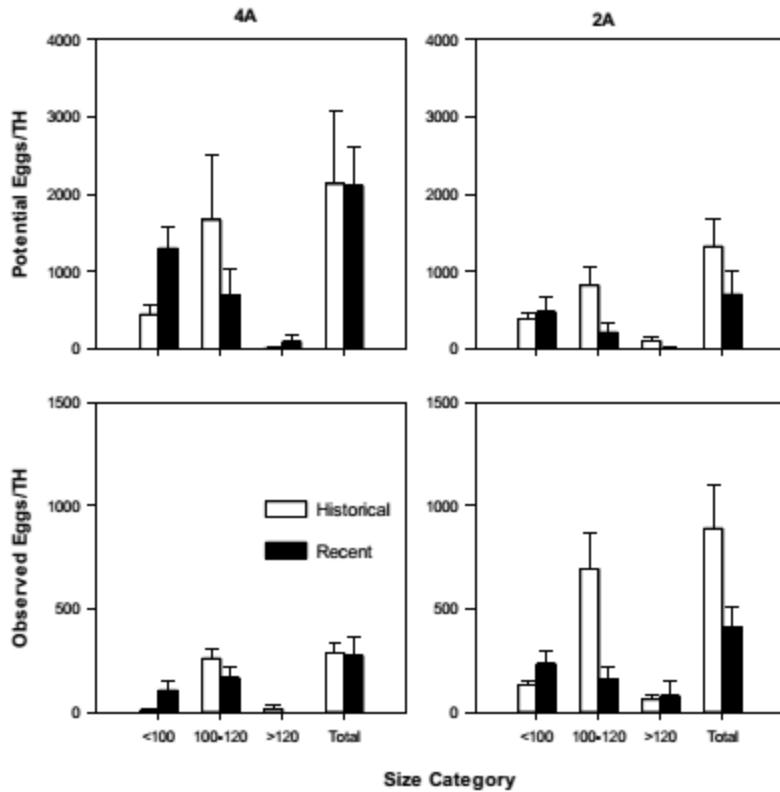


Figure 68. Average (\pm standard error) egg production potential (top panels) and observed egg production (lower panels) for four size categories (Small: <100mm; Medium: 100-120mm, Large: 120mm CL) during two time periods in Grid Groups 4A and 2A. Source: DFO 2013d.

4.3.3.2.B. UoC 4

Abundance

Landings

In the Bay of Fundy, the landings peak in 1896 (2,791 t) was followed by a decline to 53 t in the early 1900s (Figure 9). Landings rose again until 1909 (900 t) and then trended downwards until the late 1930s. As in LFA 34, annual landings rose following WW II and were relatively stable for 20 years before declining to a low point in 1976. From 1986-87 to 1993-94, seasonal landings were stable (Table 5.2) with a mean of 994 t. From 1994-95 to the present, landings increased more than 6-fold. Even since 2005-06, when the Lobster Catch and Settlement Records were in widespread use, landings have more than doubled (Table 4).

To an even greater extent than in LFA 34, current landings are very high in the Bay of Fundy as a whole and in the individual LFAs (Table 5.2). Landings in 2011-12 were almost 5 times the 50- year mean (1961-2010), and the last three years are the highest on record. Considering the period from 1975-76 to 2011-12, nine of the last ten years are in the upper quartile, the other year was in the 3rd quartile (Table 4).

Within the Bay of Fundy LFAs, the landings increase since 2005-06 has been widespread, but somewhat greater in LFA 35 (about 3-fold) compared to LFAs 36 (doubled) and LFA 38 (almost doubled).

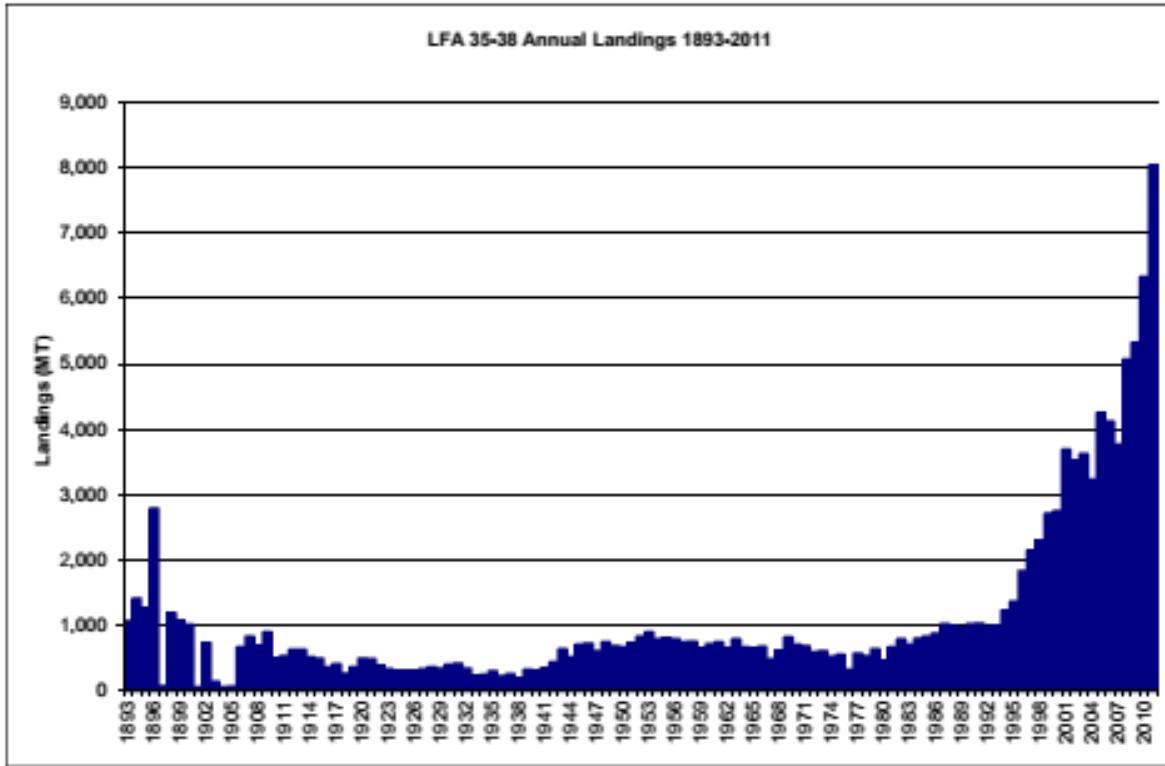


Figure 69. Annual lobster landings by the commercial fishery in LFA 35-38, 1893 to 2011. Source: Tremblay et al 2013.

Catch rates from commercial logbooks

CPUE in the Bay of Fundy has increased in all LFAs since 2005-06 (Figure 70). In the Bay of Fundy as a whole, the 2011-12 CPUE (1.9 kg /trap haul) was 1.8 times that of 2005-06. This increase in CPUE, coupled with increased fishing effort, explains the doubling of landings in the Bay of Fundy since 2005-06.

In terms of the Grid Groups, the CPUE in the Bay of Fundy has increased in Grid Groups 1 to 5, but has shown no trend in Grid Groups 6 and 7, east of Grand Manan (Figure 71).

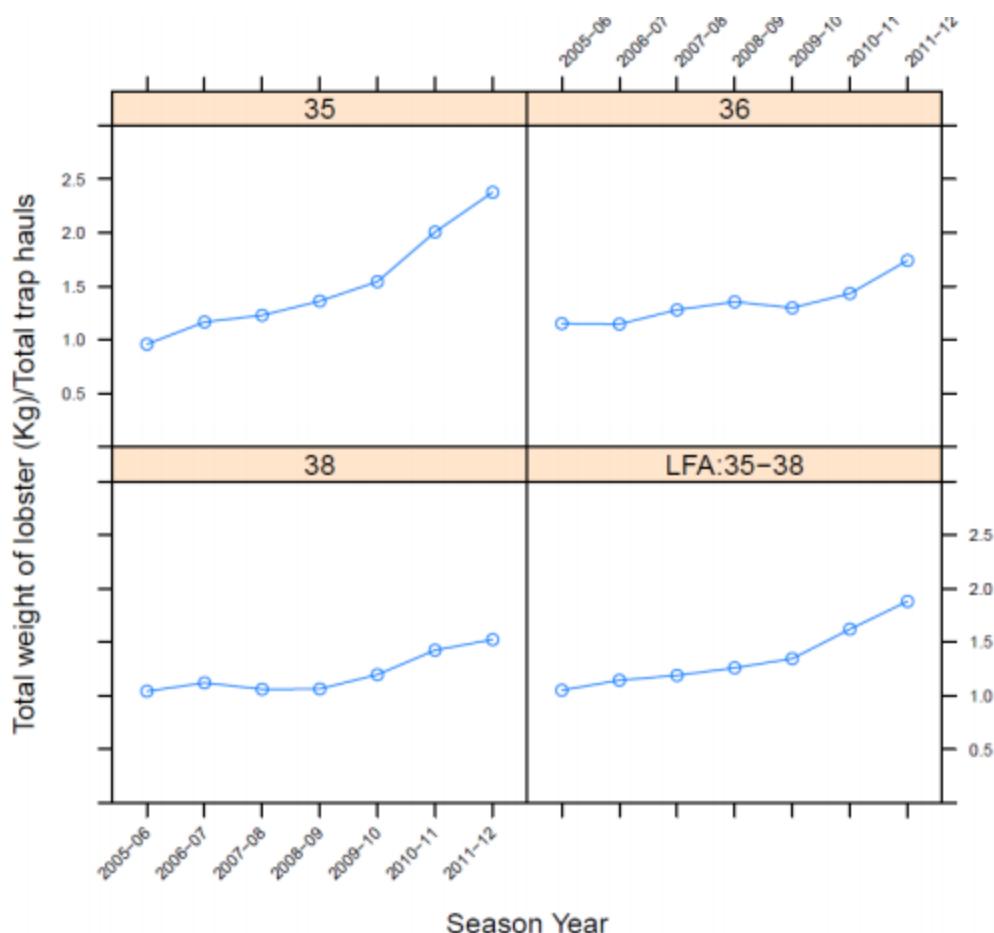


Figure 70. Commercial CPUE in LFAs 35-38 for fishing seasons 2005-06 to 2011-12. Source: Tremblay et al 2013.

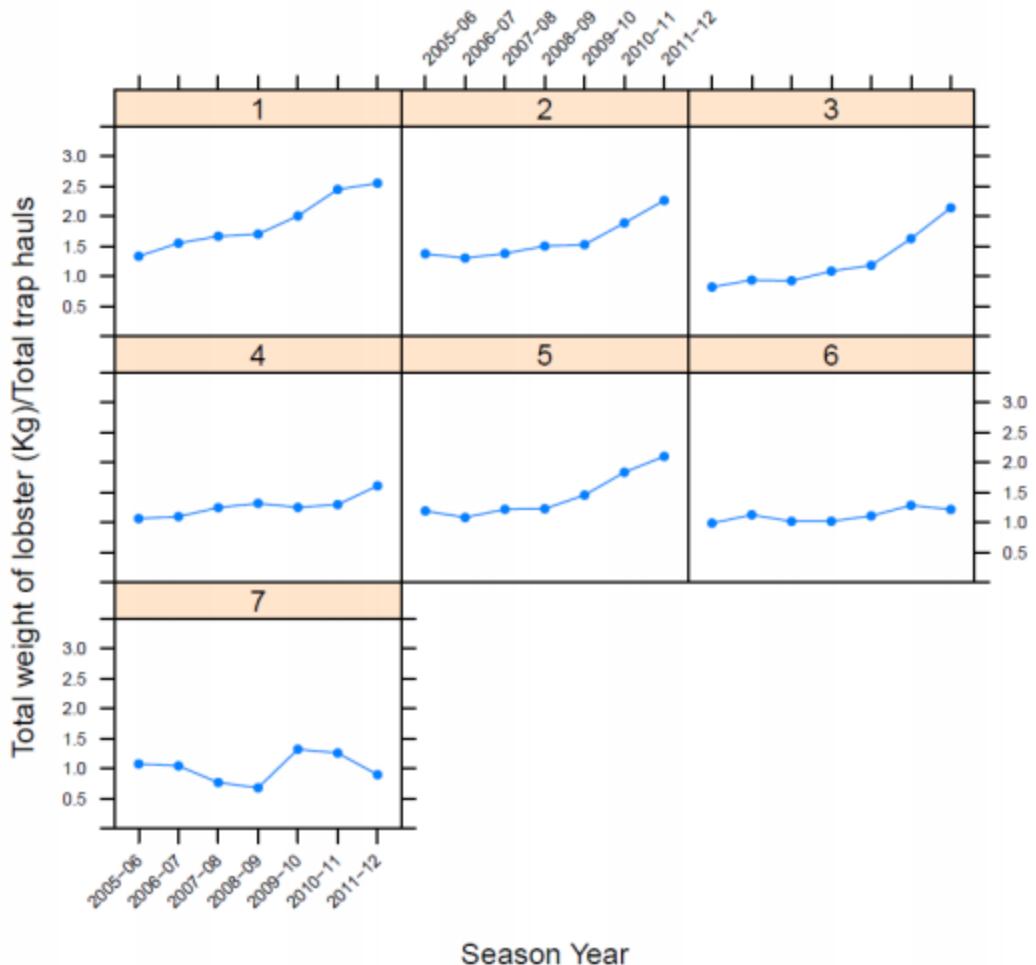


Figure 71. Commercial CPUE in LFAs 35-38 by Grid Group for fishing seasons 2005-06 to 2011-12.
Source: Tremblay et al 2013.

Fishery Independent Surveys

The proportion of summer Research Vessel sets with lobsters, increasing from <20% in the mid- 1990s to averaging over 80% in the last 10 years, indicates a wider distribution of lobsters at sufficient density to be caught routinely in the trawl survey

The mean number of lobster per tow in the summer RV survey, considered as a primary indicator of lobster abundance, was consistently low from 1970 to the late 1990s and increased thereafter (Figure 72). Mean number per tow increased dramatically in the most recent years (2011 and 2012).

The ITQ survey mean number of lobster per tow (Bay of Fundy) is provided as a secondary indicator of lobster abundance in the Bay of Fundy (Figure 73). The trend in the mean number per tow corroborates the trends in the RV survey and lobster landings.

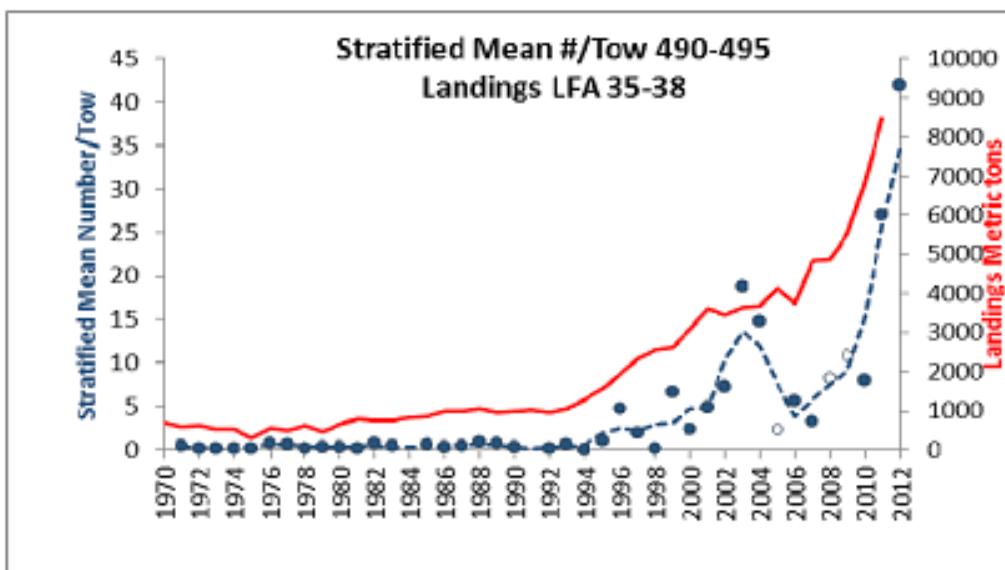


Figure 72. Stratified mean number of lobster per tow in LFAs 35-38 in the summer RV survey. Dotted line is the 3-year moving average. The landings for LFA 35-38 (red solid line) are also shown. Source: DFO 2013e.

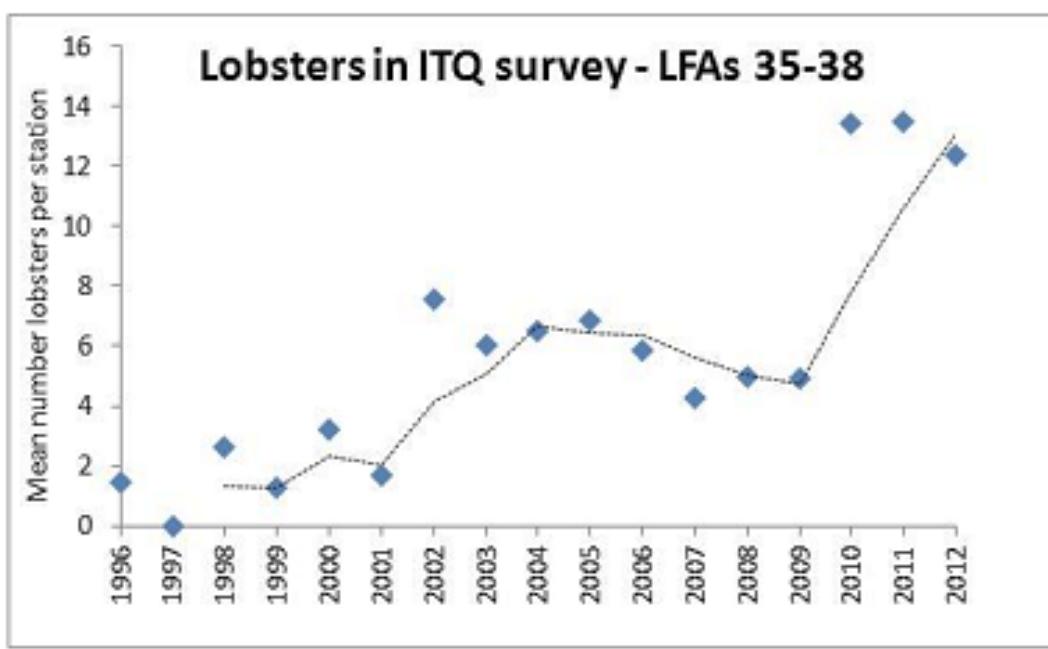


Figure 73. Mean number of lobster per tow in the ITQ survey in the Bay of Fundy, 1996-2012. The dotted line is the 3-year moving average. Source: DFO 2013e.

Scallop survey catch rates of lobsters show trends similar to the summer RV and ITQ surveys where comparisons are possible. The scallop surveys have more limited application as fishery independent indicators of lobster abundance as they have changed in design (spatial coverage, timing) and have lower catch rates per tow of lobsters.

To summarize, the summer RV and the ITQ survey number of lobsters per tow have both increased since 1996. There has been an expansion of the area with lobster catches in the surveys, which suggests a widespread increase in abundance.

Fishing pressure

Fishing effort

The total annual trap hauls reported in 2011-12 for LFAs 35-38, adjusted for reporting, were 1.2 times those reported for 2005-06 (Figure 74). Reported effort in terms of average days fished has also increased since 1997-98 in all Bay of Fundy LFAs. In terms of average number of grids fished, there is an increase in the daily average in LFA 35, but overall the data are variable with no consistent trend. Variation in the first 3-4 years might be attributed to reporting issues. The trends in the annual number of trap hauls, and in the average number of days fished provide evidence for a gradual increase in fishing effort in the Bay of Fundy over the last 6 years and since 1997-98.

It is noted that, even though the average number of days fished has increased within the Bay of Fundy, overall it is still lower than LFA 34. Total number of days fished is also lower in LFAs 35-38, as is the total number of trap hauls on an area basis.

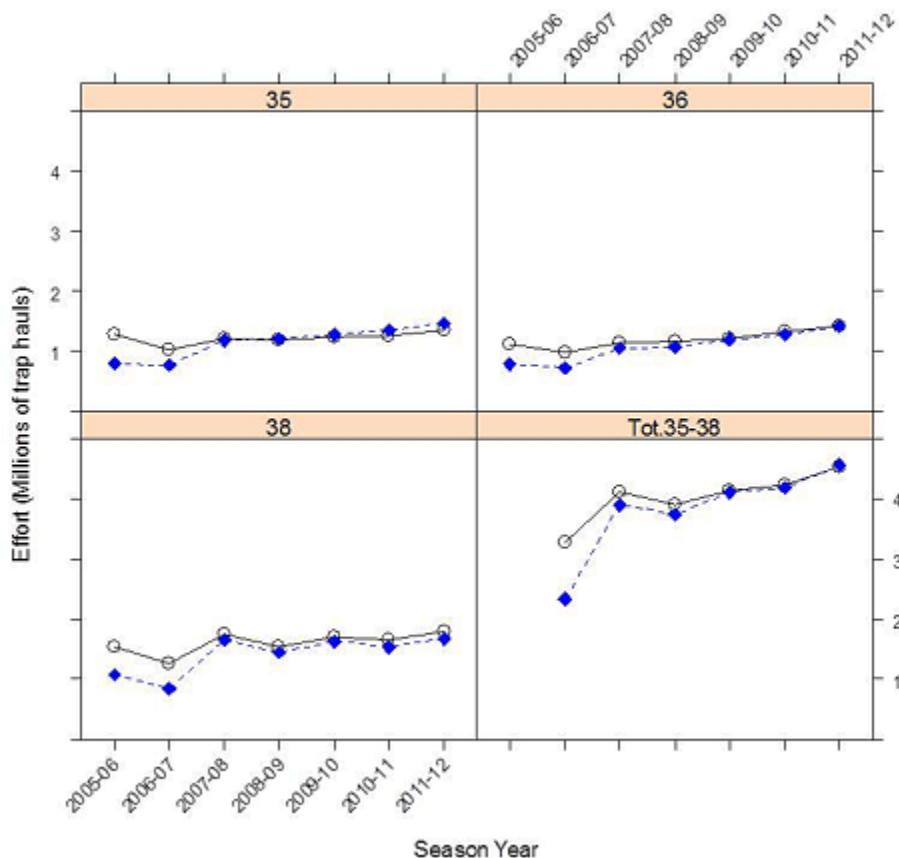


Figure 74. LFA 35-38 effort (number of trap hauls) for fishing seasons 2005-06 to 2011-12. Data are from the estimate portion of Lobster Catch and Settlement Reports. Blue dashed line is total from logs; solid line is adjusted effort (weightout slip landings/CPUE). Source: Tremblay et al 2013.

Exploitation rate (ER)

Results for LFA 35 are summarized in Table 42. The CCIR method applied here resulted in a high proportion of estimates with wide confidence intervals, so partial results for just 4 years are displayed in Table 4. Of the available estimates with confidence intervals less than +/- 0.3, the average was 0.66 for Grid Group 1 in the upper Bay and 0.88 for Grid Group 3 in the lower Bay. It is expected that the exploitation rate in the Bay of Fundy is lower than in LFA 34.

Table 42. Average annual exploitation estimates for LFA 35 for seasons 2006-07 to 2011-12, for male and female lobsters. Brackets contain the number of years the estimate is based on.

	Males	Females	Total
LFA 35, Grid Group 1	0.61 (3)	0.74 (2)	0.66
LFA 35, Grid Group 3	0.91 (1)	0.84 (1)	0.88
Total	0.68	0.77	0.72

Size structure

Considering at-sea samples from 1989 to the present, the largest size (95th percentile, Figure 75) of female lobster in the legal portion of the catch in commercial traps has trended downward in the last decade in some parts of the Bay of Fundy (LFA 36 and part of LFA 35).

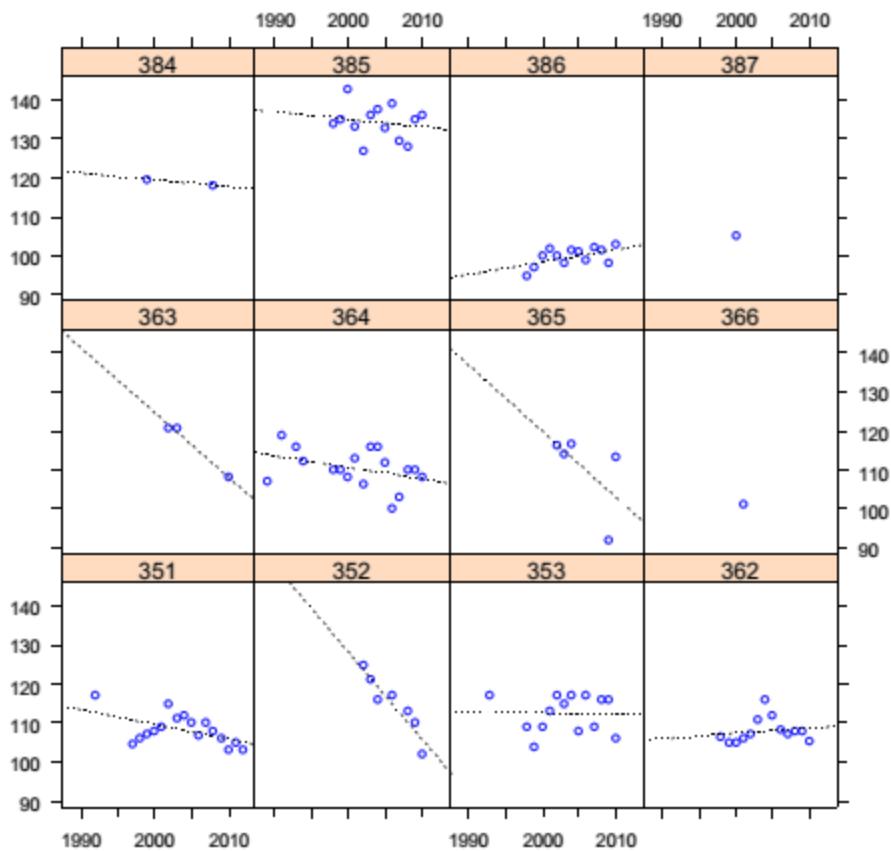


Figure 75. Trend in large female size lobster from the legal (≥ 82.5 mm) portion of at-sea samples in LFA 35- 38 Grid Groups, 1989-2012. The 95th percentile by year is shown. Ovigerous females are excluded. The Dotted line is the linear fit. Subpanel labels are comprised of the LFA (first two digits) and Bay of Fundy Grid Group (last digit). Source: DFO 2013e.

Production

Several new estimates of SOM50 were obtained for lobsters in the Bay of Fundy in 2011. These varied among locations from 90.2 mm to 103.6 CL. This variability is hypothesized to be an artefact caused by mating failure and small sample sizes. In locations where mating success was higher, SOM50 was around 91 mm CL, indicating that a downward shift in maturity has occurred since the late 1970s. This trend is corroborated by the decreasing size of the smallest berried females in the Bay of Fundy.

Because of the downward shift in the SOM50 and the increased abundance of lobsters, the total egg production potential (predicted from the maturity ogive) increased substantially in four representative locations (Alma, Dipper Harbour, North Head and Seal Cover) when comparing the last 5-7 years to a historical time period in the 1980s (Figure 76). However, the observed egg production index, based on catch rates and fecundity-at-size of ovigerous females, did not increase to the same extent. This discrepancy between the observed egg production versus egg production potential was caused by a lower than expected contribution to egg production by small mature females, likely because of low mating rates, and a reduction in the catch rates of large females. In addition, egg production is hypothesized to be limited by a lack of large males, especially for North Head (i.e. sperm limitation), or saturation of the mating grounds because the proportion of males has increased in some regions (e.g.

Alma, Dipper Harbour, and Seal Cove). This is consistent with the declining trend in large berried females.

In summary, despite an increase in lobster abundance over the last 20 years, observed egg production has not increased in the same manner. Mating success of small mature females was lower and, thus, their contribution was lower than expected.

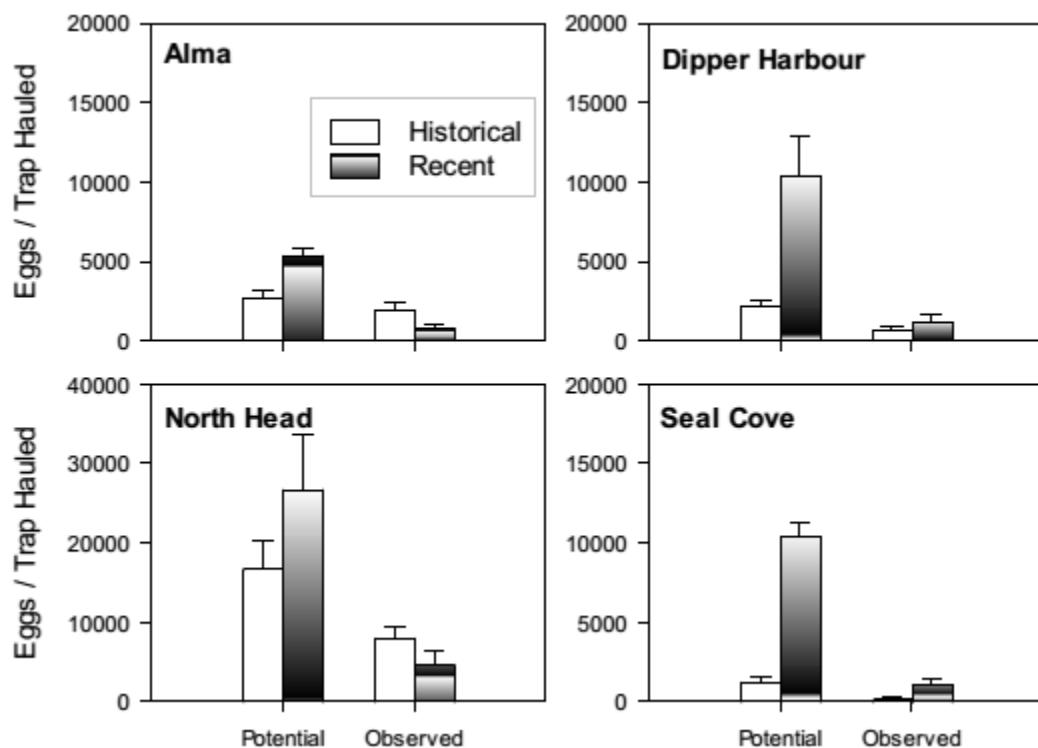


Figure 76. Lobster egg production for four locations within the Bay of Fundy for historical (1980s) and recent time (past 5-7 years) periods. Potential egg production (based on non-ovigerous females) and observed egg production (based on ovigerous females) are shown. Source: DFO 2013e.

4.3.3.3 Uncertainties

4.3.3.3.A. UoC 2 (DFO 2013d)

It is assumed that the subset of commercial fishing logbooks with useable data is representative of all logbooks. This is reasonable given that useable records in recent years accounted for upwards of 80% of all records and catches and 90% of all effort.

Landings are a function of abundance, the level of fishing effort (trap hauls, soak-days, timing of effort and fishing strategy) and catchability. Catchability in turn is affected by environmental conditions, gear efficiency including trap design and bait, and other factors. Changes in any of these can affect landings and catch rates. Thus, landings do not necessarily reflect the changes in abundance. Area-specific commercial CPUE should be more closely related to true abundance but will still be affected by catchability.

Any changes in fishing efficiency (or “effective effort”) have not been accounted for here. If fishing efficiency has increased since the last assessment (2006) due to larger vessels, better navigation or improved fishing strategy, then commercial CPUE may inflate the perception of abundance in recent years. Given that the catch rate of lobsters in fishery independent surveys has showed a trend similar to that based on commercial logbooks, recent changes in fishing efficiency are unlikely to be important to the perception of abundance.

The fishery independent surveys show abundance trends similar to those seen in fishery dependent data, but examination of size structure in the trawl catch has not detected changes over the last 10 years as might be expected given a surge in recruitment. In addition, there is interannual variation in the number of lobsters per tow that is reflected in both sublegal and legal size lobsters.

FSRS traps are limited to nearshore areas and may not represent the sublegal sizes in the midshore and offshore areas.

Methods of estimating exploitation rates have various assumptions, not all of which are met in the applications here. The methods are robust to some violations of assumptions but not all have been examined here. The methods used here should be reliable for measuring trends over time.

4.3.3.3.B. UoC 4 (DFO 2013b)

It is assumed that the subset of commercial fishing logbooks with useable data is representative of all logbooks. This is reasonable given that useable records in recent years accounted for upwards of 80% of all records and catches, and 90% of all effort.

Landings are a function of abundance, the level of fishing effort (trap hauls, soak-days, timing of effort and fishing strategy) and catchability. Catchability in turn is affected by environmental conditions, gear efficiency including trap design and bait, and other factors. Changes in any of these can affect landings and catch rates. Thus, landings do not necessarily reflect the changes in abundance. Area-specific commercial CPUE should be more closely related to true abundance but will still be affected by catchability.

Any changes in fishing efficiency (or “effective effort”) have not been accounted for here. If fishing efficiency has increased in the last five years due to larger vessels, better navigation or improved fishing strategy, then the catch rate index may inflate the perception of abundance in recent years.

Given that the catch rate of lobsters in fishery independent surveys has showed a trend similar to that based on commercial logbooks, recent changes in fishing efficiency are unlikely to be important to the perception of abundance.

Number of sea sampling trips has generally been low for most years and, thus, intra-annual sampling variability as well as potential annual differences in catchability are sources of uncertainty in the egg production indices. However, averaging trends among different time periods is believed to alleviate the issue of this low sampling intensity and, therefore, the trend described here is expected to reflect what is happening in the stock.

FSRS traps are limited to small portions of LFA 35 and may not represent the sublegal sizes in the rest of LFAs 35-38.

The fishery independent surveys show abundance trends similar to those seen in fishery dependent data, but examination of size structure has not detected changes over the last 10 years as might be

expected given a surge in recruitment. In addition, there is interannual variation in the number of lobsters per tow that is reflected in both sublegal and legal size lobsters.

Exploitation rate for the Bay of Fundy was estimated from a limited number of FSRS traps in a few locations of LFA 35. Other datasets were insufficient to provide estimate for the Bay of Fundy as a whole. Additional data is required to be able to reliably estimate exploitation rates.

4.3.3.4. Reference Points

Egg production per recruit (EPR) reference points have formally been adopted in Canada (FRCC 1995, Fogarty and Gendron 2004). A goal of doubling EPR relative to 1995 levels has been adopted as a management target (FRCC 1995).

The IFMP (DFO 2011a) accepted to use the proxy of landings as the starting point. Some candidate interim thresholds for lobster fisheries have been developed based on landings. Other reference points have been proposed for the LFAs 34-38.

4.3.3.4.A. UoC 3

A precautionary approach proposed for lobster in LFA 34 utilizes reference points for the abundance of legal sizes (landings, commercial catch rate) and the abundance of legal and sublegal sizes combined (ITQ survey). These indicators are above their Upper Stock References (USR), indicating that the lobster stock in LFA 34 is in the healthy zone.

Landings-based reference points for the abundance of legal sizes are based on the median of the lobster landings from 1985-2009 as a Biomass at Maximum Sustainable Yield (B_{MSY}) proxy (Tremblay et al 2012). For the upper stock reference (USR) and limit reference point (LRP), the values of 80% and 40% were selected. For LFA 34, the USR is calculated to be 8,867 t. The metric for assessing where the stock is relative to the reference points is the 3-year running average of landings. This metric is 21,147 t for the season ending 2011-12, putting LFA 34 lobster in the healthy zone, well above the USR.

A USR for abundance of legal size lobsters based on the commercial CPUE for LFA 34 as a whole is proposed (Figure 77). While there have been spatial differences in CPUE trends within LFA 34, all Grid Groups have trended upwards in the last 14 years and the trend in the raw CPUE is expected to reflect the trend in most subareas. It is proposed that the median CPUE for the period 1998-99 to 2008-09 (= 0.78 kg/trap haul) be used as a proxy for BMSY. This period covers much of the available time series for CPUE, considered a productive period, but it does not include the last 3 record-breaking seasons. A USR equal to 80% of the median (=0.62 kg/trap haul) is proposed.

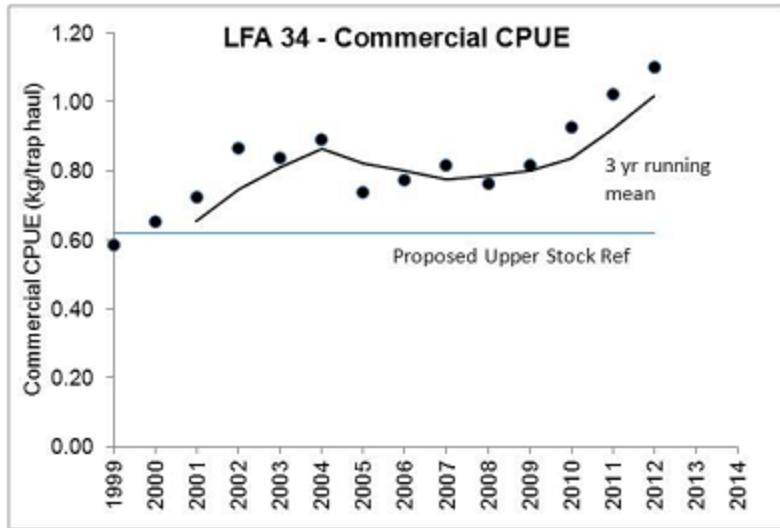


Figure 77. Proposed USR (horizontal line) based on commercial CPUE for LFA 34. Shown is annual commercial CPUE (total weight landed/total trap hauls), with USR based on 80% of the median CPUE from 1998-99 to 2008-09 (=0.62 kg/trap haul). Also shown is the 3 year running mean (=1.0 after 2011-12 season). Source: DFO 2013d.

This USR is close to the CPUE measured at the start of the CPUE time series (1998-99, CPUE = 0.58 kg/trap haul). The metric for assessing where the stock is relative to the USR is the 3-year running mean of the commercial CPUE. The current 3-year running mean (1.0 kg/trap haul) is well above the proposed USR.

A proposed fishery independent USR for legal and sublegal lobster abundance is 80% of the median catch rate in the ITQ survey for the period 1996-2009 (Figure 78). The period 1996 to 2009 is proposed to avoid the initial year that involved protocol development. The end year (2009) is consistent with the landings-based reference points. The median of the above period (23.7 lobsters per tow) is proposed as a BMSY proxy, and a USR of 80% of this (19.0 lobsters per tow) is suggested. As for the previous USRs, it is proposed that the 3-year mean be used as the metric to assess stock status in relation to the reference point. The current 3- year mean (71.9) is well above the proposed USR.

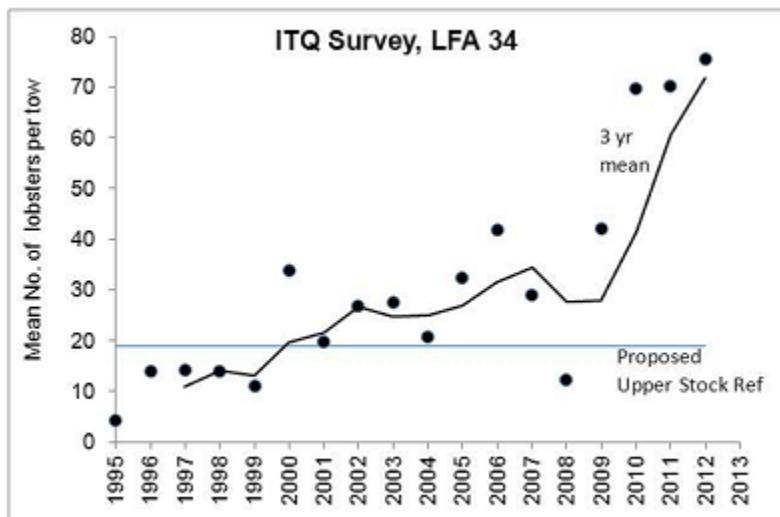


Figure 78. Proposed USR for lobster in LFA 34 based on ITQ survey. Source: DFO 2013d.

4.3.3.4.B. UoC 4

A precautionary approach proposed for lobster in LFA 35-38 utilizes reference points for the abundance of legal sizes (landings, commercial catch rate) and the abundance of legal and sublegal sizes (summer RV catch rate). These indicators are above their USR, indicating that the lobster stock in LFA 35-38 is in the healthy zone.

Landings-based reference points for the abundance of legal sizes are based on the median of the lobster landings from 1985-2009 as a B_{MSY} proxy (Tremblay et al 2012; Table 43). For the USR and LRP, the values of 80% and 40% were used. These values are provided for each LFA in the IFMP (DFO 2011a). For assessment purposes, landings reference points are evaluated for the Bay of Fundy as a whole.

The mean of the last 3 years is taken as the metric to assess whether landings have dropped below the USR. The 3-year running mean is 6,936 t for the fishing season 2011-12, putting these LFAs in the healthy zone, well above USR.

Table 43. Landings-based reference points for the Bay of Fundy as a whole. Source: DFO 2013e.

	LFA 35-38
B_{MSY} proxy - Median 1984-85 to 2008-09	1,969 t
Upper Stock Reference	1,575 t
Limit Reference Point	788 t
3-Year Running Mean	6,936 t

A USR based on commercial CPUE is proposed. For LFAs 35-38, the time series of reliable catch and effort data is only 7 years. It is proposed that the median CPUE from the start of the CPUE series (2005-06) to 2008-09 (=1.16 kg/ trap haul) be used as a basis for the USR. Because the short time series is restricted to a period of high abundance, the USR is adjusted to the expected CPUE levels in the mid-1990s based on landings and estimated effort; thus, the proposed USR is set at 50% of the median (0.58 kg per trap haul) (Figure 79).

As for the landings based USR, it is proposed that the mean of the last 3 years be taken as the metric to assess whether CPUE has dropped below the USR. The current 3-year mean (1.6 kg per trap haul) is well above the proposed USR.

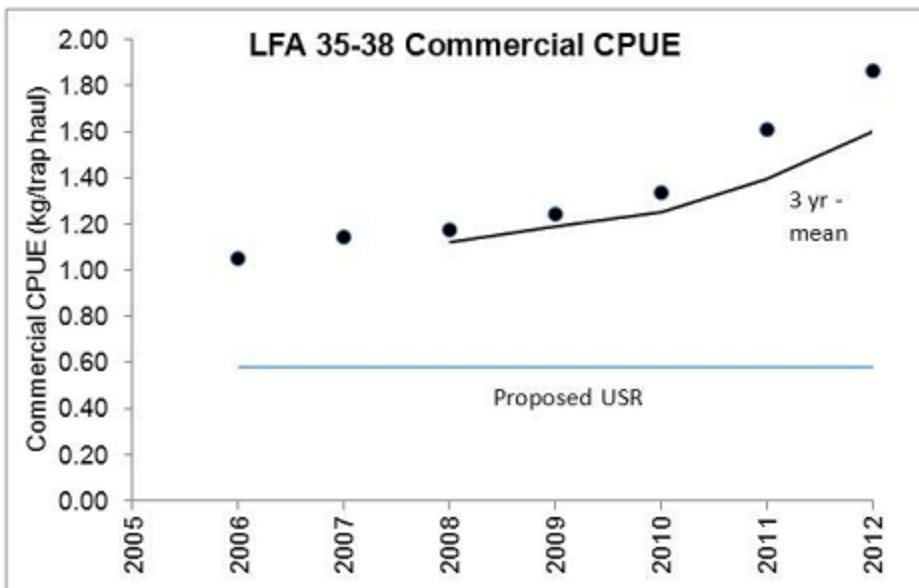


Figure 79. Proposed USR (horizontal line) based on commercial CPUE for LFA 35-38. Shown is annual commercial CPUE (total weight landed/total trap hauls), with USR based on 50% of the median CPUE from 2005-06 to 2008-09 (1.16 kg/trap haul). Also shown is the 3 year running mean (=1.6 after 2011-12 season). Source: DFO 2013e.

A fishery independent USR is proposed for legal and sublegal lobster abundance in the Bay of Fundy based on the median catch rate in the summer RV surveys in strata 490-495. It is proposed to use the period 1985-2009 as the basis for comparison of future trawl catch rates of lobsters. The median for this period is 2.4 lobsters per tow, the proposed USR is 80% of this, or 1.9 lobsters per tow (Figure 80). The 3-year running mean as of 2012 was 25.7 lobsters per tow, which is well above the proposed USR (1.9 lobsters per tow).

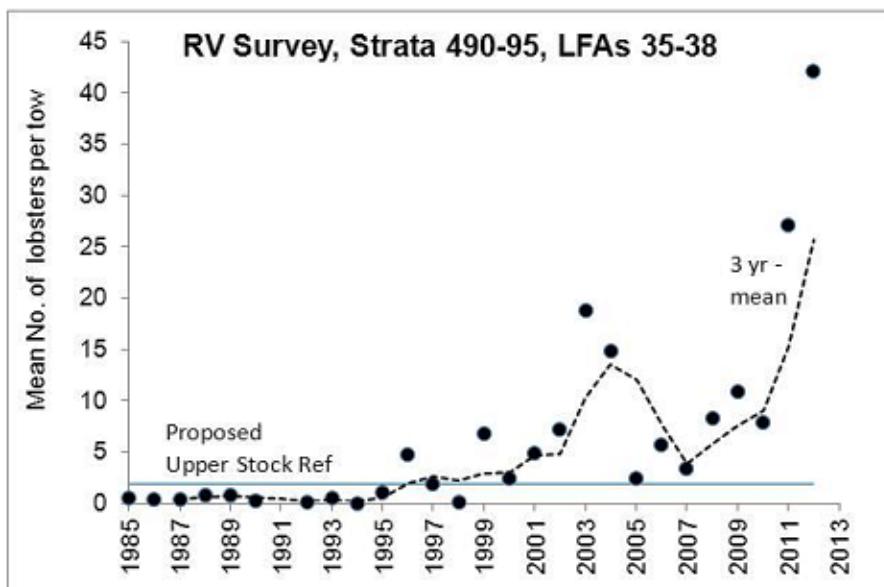


Figure 80. Proposed reference point for lobster abundance in LFAs 35-38 based on summer RV survey. The median for 1985 to 2009 (2.4 lobster/tow) is used as the B_{MSY} proxy. Solid line is 3-year running year. Source: DFO 2013e.

4.3.3.5. Harvest Strategy, Harvest Control Rules and Tools

The lobster fisheries are managed by effort control (input fishery). The four most important measures in controlling effort are the limited entry of lobster fishing licences, an individual trap allocation, restrictions on gear characteristics, and a limited fishing season. In addition to those management measures, other measures were implemented to protect key components of the lobster population. Lobster can only be retained if they comply with a MLS designed to allow a portion of females to reach sexual maturity before being harvesters. Egg-bearing and v-notched females must also be released. Other management measures include the requirement of escape vents to allow escapement of sublegal sizes, and biodegradable trap mechanisms to mitigate ghost fishing by lost traps.

The 1995 FRCC report indicated that most of the Atlantic lobster stocks were overexploited. The FRCC formulated objectives and recommended conservation measures. The two main objectives were to increase the egg production (eggs-per-recruit) and to reduce the exploitation rate and the effective fishing effort.

The FRCC recommended that eggs-per-recruit be increased to five percent of an unexploited population for all LFAs. The Council recognized that the five percent target was somewhat arbitrary and that it is not possible to determine precisely the minimum value of eggs-per-recruit that would adequately reduce the risk of recruitment failure. Increasing the eggs-per-recruit was seen as a precautionary measure and was not offered as an absolute guarantee against lobster stock decreases or a sure path to an increase in landings. In implementing the FRCC recommendations, DFO chose to modify the target to double eggs-per-recruit rather than aim for the five percent target suggested given the appreciable uncertainties in the estimates of eggs-per-recruit of an unexploited population.

After FRCC reviews, there have been numerous changes adopted since these reviews were completed, most notably:

- Minimum legal sizes in 1995 has increased from 70mm and 81mm in LFA 27 and LFAs 28-38 respectively to 81mm in LFA27, 84 mm in LFAs 28-29 and to 82.5mm in LFAs 30-38.
- Release of females at 135mm maximum CL, 114-124mm in LFA 30 and 31A respectively.
- Installation of biodegradable panel.
- Active V-notching program and possession restriction in all LFA's except 27 and 31A
- Escape mechanism adjusted in accordance with minimum carapace size.

The IFMP (DFO 2011a) suggests a course of action with respect to the adopted reference points:

- 1) Initially the target removal reference point will be set at the 90th percentile of exploitation rate estimates for a period identified during the next RAP review process.
- 2) DFO will begin to work with industry to agree on potential measures to take if the upper stock reference level is reached. All agreed upon potential measures will be assessed for effectiveness through the RAP process.

- 3) If landing levels decrease to the median landing values, DFO Science Branch will evaluate the cause of the reduction or identify sampling/surveys needed to identify the cause.
- 4) If landing levels reach 80% of the median landing levels the upper stock reference point will be reached and measures will be taken to reduce the removal rate. These actions may vary depending on the specific conditions of the day but will be based on the measures assessed through the RAP process. Actions will be established in consultation with industry. Reductions in landings caused by changes in the market/economic conditions will be excluded from this PA framework.
- 5) A lower limit reference point will be tentatively set at 40% of the median landing values.
- 6) When actions taken allow the state of the stock to recover above a reference point increases in the removal rate can be discussed with industry.
- 7) A DFO Working Group will be established to refine the precautionary approach. Research will be conducted to develop a better indicator of abundance to be used in the precautionary approach.
- 8) Changes to this precautionary approach will be made as better information (e.g. better proxies for abundance) becomes available after consultation with all parties. Alternatives may include multi-indicator approaches that establish thresholds for a variety of indicators and reduce the sensitivity of the PA approach to changes in any one indicator or that may not be reflective of changes in stock status.

4.4. Principle Two: Ecosystem Background

	List principle 2 Species identified during Scoring Sessions for the Southern Gulf of St Lawrence UoC 1
Retained Species	<p>Under licence conditions, rock crab (<i>Cancer irroratus</i>), cunner (<i>Tautogolabrus adspersus</i>) and sculpin (<i>Myoxocephalus octodecemspinocus</i>) are allowed to be landed. But in actual fishing practices, cunner and sculpin are not retained. Landings of rock crab by lobster fishermen represent 3% of total lobster landings in 2011.</p> <p>With respect to bait used in the NB and NS lobster fisheries, refer to section 4.4.1 Retained species.</p>
Minor Bycatch Species	<p>Information on the nature and the amount of bycatch affected by the fishery is not collected. The minor bycatch species identified with stakeholders during the site visit are sea urchins and whelk.</p>
Main Bycatch Species	<p>Information on the nature and the amount of bycatch affected by the fishery is not collected. The main bycatch species identified during the RBF meeting is sculpin.</p>
ETP Species	<p><i>Species at Risk Act or SARA, Committee on the Status of Endangered Wildlife in Canada or COSEWIC</i> (See section 4.4.3)</p> <p>Leatherback Turtle <i>Dermochelys coriacea</i> (Endangered under the SARA and the COSEWIC)</p> <p>Northern Wolfish <i>Anarhichas denticulatus</i> (Threatened under the SARA and the COSEWIC)</p> <p>Spotted Wolfish <i>Anarhichas minor</i> (Threatened under the SARA and the COSEWIC)</p> <p>Marine mammals (See section 4.4.3)</p> <p>Sources</p> <p>http://www.sararegistry.gc.ca/sar/index/default_e.cfm</p> <p>http://www.dfo-mpo.gc.ca/species-especes/search-species-recherche-especies-eng.htm</p>

	List principle 2 Species identified during Scoring Sessions for the East and South Scotian Shelf, and Bay of Fundy UoCs 2, 3, and 4
Retained Species	<p>All inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab (<i>Carcinus maenas</i>), rock crab (<i>Cancer irroratus</i>), and sculpin (<i>Myoxocephalus octodecemspinocus</i>). In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab (<i>Cancer borealis</i>) that is 130 mm and greater in length.</p> <p>With respect to bait used in the NB and NS lobster fisheries, refer to section 4.4.1 Retained species.</p>
Minor Bycatch Species	<p>Information on the nature and the amount of bycatch affected by the fishery is collected occasionally.</p> <p>There are few bycatch species as approximately 95% of the catch is the target species. The minor bycatch species identified are crab species, sea urchins and whelk.</p>
Main Bycatch Species	<p>Information on the nature and the amount of bycatch affected by the fishery is collected occasionally.</p> <p>According to MSC GCB3.5.2, the assessment team considers Atlantic cod (<i>Gadus morhua</i>) and cusk (<i>Brosme brosme</i>) as main bycatch species.</p>

<p>ETP Species</p> <p><i>Species at Risk Act or SARA, Committee on the Status of Endangered Wildlife in Canada or COSEWIC</i> (See section 4.4.3)</p> <p><i>Leatherback Turtle Dermochelys coriacea</i> (Endangered under the SARA and the COSEWIC)</p> <p><i>Northern Wolfish Anarhichas denticulatus</i> (Threatened under the SARA and the COSEWIC)</p> <p><i>Spotted Wolfish Anarhichas minor</i> (Threatened under the SARA and the COSEWIC)</p> <p>Marine mammals (See section 4.4.3)</p> <p>Sources</p> <p>http://www.sararegistry.gc.ca/sar/index/default_e.cfm</p> <p>http://www.dfo-mpo.gc.ca/species-especies/search-species-recherche-especies-eng.htm</p>
--

4.4.1. Retained species

The Assessment Team had proposed to score the PI 2.1.1 Retained Species Outcome using the MSC's Risk-Based Framework (RBF)¹¹ for all UoCs, but as further information was obtained during the site visit, it was determined that this PI could be scored using the default PISGs.

4.4.1.1 Southern Gulf of St Lawrence (UoC 1)

Under licence conditions, rock crab (*Cancer irroratus*), cunner (*Tautogolabrus adspersus*) and sculpin (*Myoxocephalus octodecemspinosus*) are allowed to be landed. However, in actual fishing practices, cunner and sculpin are not retained (*pers. comm.* lobster harvesters and DFO, during site visit meetings).

Rock crab

Under licence conditions and the section 55 of the AFR¹², lobster harvesters are allowed to retain male rock crab without requiring a rock crab licence.

The rock crab fishery in the SGSL is comprised of three distinct components: the bycatch fishery, the bait fishery and the directed fishery (DFO 2013c). Bycatch and bait fisheries are conducted during the lobster fishery by lobster licence holders. The direct fishery is conducted at different time, by rock crab licence holders. The rock crab fishing areas are identical to lobster fishing areas.

Data on bycatch of male rock crab caught during the lobster fishery were compiled from sales transactions and other statistics from DFO Fisheries and Aquaculture Management Branch. The amount of rock crab landed by lobster harvesters was incorporated in the assessment of the rock crab stock in the SGSL (DFO 2013b).

Landings of male rock crab during the lobster fishery are shown in Table 44. Preliminary landings for 2011 show a total of 283 t of rock crab landed by lobster harvesters from LFAs 23, 25, 26A and 26B (Table 44), which represent 7% of the total directed fishery landings. Rock crab landings by lobster fishermen represent 3% of the total lobster landings by NB and NS fishermen.

¹¹ http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/bay-of-fundy-scotian-shelf-and-southern-gulf-of-st-lawrence-lobster-trap/assessment-downloads-1/20140311_Use_of_the_RBF_LOB428.pdf

¹² <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-21/page-13.html#h-26>

Table 44. Rock crab landings (t) by lobster licence holders by LFA. Data for 2011 are preliminary. Source: DFO 2013c.

Year	23	24	25	26A	26B	Total Bycatch	% of Directed	Total Directed
2000	284	18	230	223	0	755	17%	4,360
2001	244	22	278	370	0	914	19%	4,727
2002	352	17	272	344	0	985	23%	4,349
2003	227	16	191	302	0	736	20%	3,685
2004	261	20	203	492	0	976	24%	4,041
2005	194	37	172	293	0	696	15%	4,552
2006	170	21	101	227	0	519	12%	4,172
2007	121	30	141	239	0	531	12%	4,550
2008	85	11	143	266	0	505	11%	4,417
2009	68	39	84	227	0	419	10%	4,274
2010	71	13	66	186	0	335	8%	4,187
2011	29	12	42	211	1	295	7%	4,197

There is no estimate of the quantity of rock crab caught and used as bait during the lobster fishery.

The management of the directed rock crab fishery is based on effort control (number of licences, trap allocation, restrictions on gear characteristics, and limited fishing season), with individual catch allocations (except in LFA 24) and by a MLS (DFO 2013c). Female cannot be landed. All rock crab landings from the directed fishery are verified through a dockside monitoring program. Logbooks are mandatory and must record daily catch, effort, and fishing locations.

The bycatch fishery operated with daily limits and a MLS between 1999 and 2003, but those restrictions were dropped because there were contradictory to the AFR (1985). Lobster licence holders are entitled to keep any size male rock crabs without limits. However, the use of larger escape mechanism in lobster traps adjusted to the lobster MLS could reduce the retention of small male rock crabs (DFO 2013c).

There is no estimate of total biomass of rock crab in the SGSL, in term of male biomass available to the fishery or estimates of exploitation rates. But according to the last SAR (DFO 2013c) providing an assessment of the rock crab resource and the fisheries of the SGSL to the 2011 fishing year, catch rates in 2011 were above the average of the 2000 to 2010 period except for LFA 24 and were all higher than those observed in 2006. A wide size frequency distribution and a balanced sex ratio were observed on trawl data and scientific trap survey. Although there are uncertainties in the stock assessment (total removals are not known, stock status indicators are almost all fishery-dependent, interpretation of catch rates), there is no sign suggesting a negative change in rock crab abundance in the recent years. Rock crab has a high biomass and is widely distributed in the coastal areas of the SGSL (DFO 2013c).

During the site visit, lobster harvesters and DFO pointed out that due to the very low commercial value of rock crab landed as bycatch and the competition with the directed fishery, there is no incentive to seek out and capture rock crab. Evidence is the decrease of rock crab landings by the lobster harvesters in the recent years (Table 18). Moreover, the use of larger escape mechanism in lobster traps adjusted to the lobster MLS could reduce the retention of small male rock crabs (DFO 2013c).

Bait

CB3.5.5 The assessment team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.

DFO conducted telephone surveys in 2005 and 2011 to gain additional information on the fishery. A section of the survey was related to the nature and amount of bait used in the NB and NS lobster fishery. According to DFO, and lobster harvesters (during RBF meeting), **the main species used as bait in the NB and NS lobster fisheries are herring (*Clupea harengus*) and Atlantic mackerel (*Scomber scombrus*)**. The estimated amount of herring and mackerel used as bait in 2012 was 4,274 t and 1,546 t, respectively, for all combined LFAs. Mackerel and herring (fall spawning) used as bait are purchased by lobster harvesters to local directed fisheries (Atlantic Canada), so the amount used is already accounting into the mackerel and herring fisheries management system. A small portion (approximately 13%) of mackerel comes from the U.S. Atlantic mackerel fishery.

Other species may be used in lower quantity included gaspereau and silversides. Some harvesters in LFA 23 can use rock crab occasionally as a supplement to traditional bait.

Atlantic mackerel in the Northwest Atlantic

The Northwest Atlantic mackerel stock is a transboundary stock that ranges from North Carolina in U.S. to Labrador in Canada, with northern and southern spawning contingents (TRAC 2010). This stock is migratory and seasonal distribution patterns are influenced by water temperature. The TAC is Atlantic-wide with allocation for U.S. and Canada mackerel fisheries.

According to the last joint Canada/U.S. Transboundary Resources Assessment Committee (TRAC) mackerel stock assessment (TRAC 2010), giving the uncertainty in the stock assessment, the TRAC could not determine overfished and overfishing status, and considered the status of the Northwest Atlantic mackerel to be “unknown”. The assessment model exhibited strong retrospective patterns and was also faced with uncertainty in stock structure and in particular whether the U.S. and Canadian contingents should be classified as two distinct mackerel stocks or one unit stock (NEFSC 2014).

The Canadian and U.S. Atlantic mackerel contingents were assessed separately and these assessments were used by the Assessment team in the context of the PEI lobster fishery assessment.

Canadian Atlantic mackerel

The Canadian Atlantic mackerel fisheries are prosecuted using gillnets, trapnets, handlines and purses seines and managed under an Integrated Fisheries Management Plan effective from 2007¹³. Mackerel fisheries are input control (licensing, fishing season, gear characteristics) and output control (TAC) fisheries. The TAC is Atlantic-wide, and Canadian TAC was 60,000 t following the 2010 Canadian Advisory Committee (DFO 2014b). Finally, following the 2012 Canadian Advisory Committee, the TAC was set at 36,000 t to equal the US TAC despite a scientific advice that recommended annual catches not exceeding 9,000 t (DFO 2012e). For several years, 40% of the Canadian TAC has been allocated to large seiners and 60% to small seiners and other gears (DFO 2012e). The three Canadian provinces with the largest landings are Newfoundland and Labrador, PEI and Quebec. 65%, 19% and 10% of TAC has been caught in 2010, 2011 and 2012, respectively.

¹³ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/mackerel-atl-maquereau/mac-atl-maq-2007-eng.pdf>

Mackerel landings for NB and NS are shown in Table 45.

Table 45. Landings (t) of mackerel from New Brunswick (NB) and Nova Scotia (NS). Landings for 2012 and 2013 are preliminary. Source: DFO 2014b.

Year\Province	NB	% of total	NS	% of total	Atlantic total
2010	1,260	3.2%	666	1.7%	38,753
2011	903	8%	416	4%	11,401
2012	524	8%	683	10%	6,468
2013	111	1.5%	388	5%	7,431

As a result of the last stock assessment (DFO 2014b), age at 50% maturity has varied little over the years. However, length at 50% maturity has varied and in most cases it is greater than the minimum authorized length of catch of 250 mm. the fact that catches may target immature fish represents an additional pressure for the stock. The abundance index from the egg survey dropped significantly between 1993 and 1998, following by an increase caused by the arrival of the strong 1999 year-class. The index dropped again from 2002 to reach since 2005 the lowest values of the series, which reflects the collapse of the stock.

An analytical assessment based on a sequential population analysis (SPA) was undertaken using the Canadian catch-at-age (1996-2013) and the abundance index from the Southern Gulf of St Lawrence egg survey (1996-2013). Mortalities calculated by age group remain high with values superior than 0.46. The significant increases in fishing mortality were accompanied by declines in spawning and total biomasses (Figure 81). The lowest biomasses of the whole historical series were estimated in 2012 and 2013.

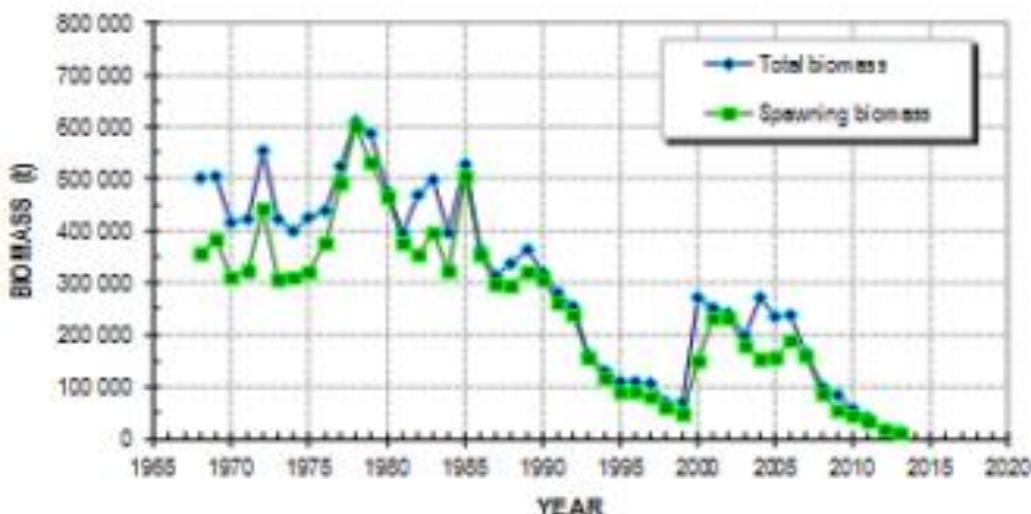


Figure 81. Total and spawning Atlantic mackerel biomasses (t) in NAFO subareas 3 and 4 for the 1968-2013 period. Source: DFO 2014b.

From 2007 to 2009, the trajectory of the stock moved inside the “overfishing and not overfished” area (Figure 82), but the trajectory subsequently remained in the “overfishing and overfished area”.

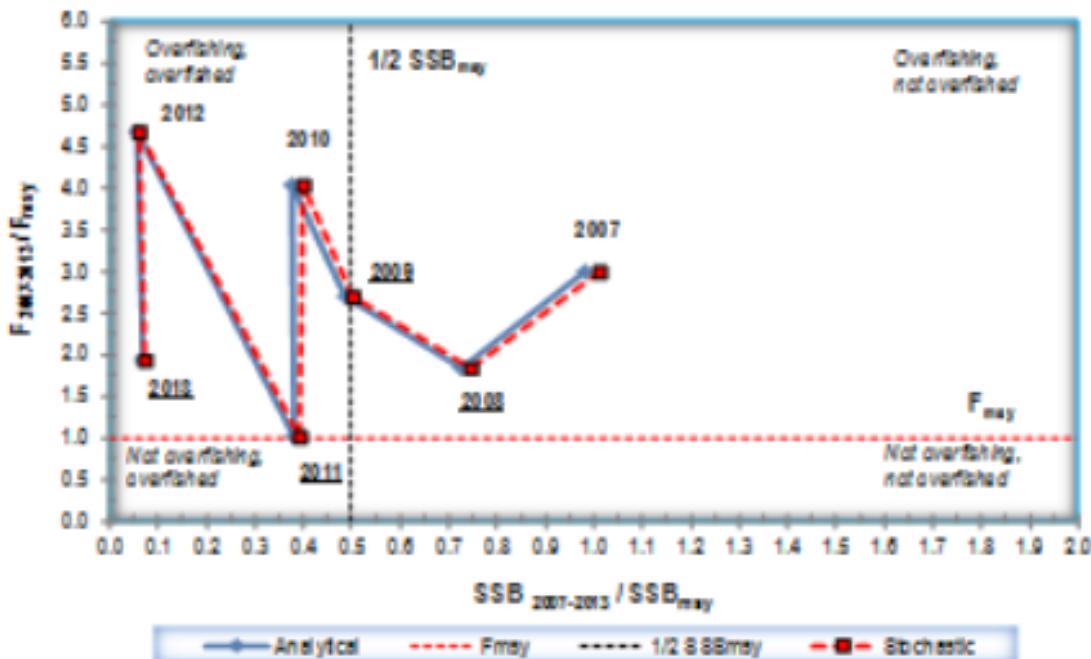


Figure 82. Status of the fishing mortality (F) and spawning biomass (SSB) (t) of the Atlantic mackerel in NAFO subareas 3 and 4 in 2013 and trajectory of the stock estimated since 2007 from the results of the retrospective analyses. Spawning biomasses at the maximum sustainable yield (MSY) were estimated by analytical and stochastic approaches. Source: DFO 2014b.

The 2010 TRAC assessment results are consistent with the decreasing trend in the spawning biomass in the Gulf of St Lawrence reported in the 2008 Canadian mackerel assessment. And the level of spawning biomass reported in the 2014 Canadian mackerel assessment is even lower.

U.S. Atlantic mackerel

A small portion (approximately 13%) of mackerel comes from the U.S. Atlantic mackerel fishery. The U.S. Atlantic mackerel fishery primarily uses mid-water and bottom trawls. The Atlantic mackerel, well-managed and resilient species, is managed by the Mid-Atlantic Fishery Management Council and the NOAA's National Marine Fisheries Service under a Fishery Management Plan established in 1978. Landings of Atlantic mackerel in US were 6,019 t and 5,250 t in 2012 and 2013, respectively. The FMP includes a number of measures to ensure sustainable harvesting including input (limited access program) and output (quotas) controls, reference points, and protection of mackerel Essential Fish Habitats^{14,15}. As a result of the last stock assessment, fishing mortality remains very low (below $F=0.06$) since 1992, and the Atlantic mackerel spawning stock biomass (SSB) is 2.3 million mt for a SSB_{MSY} of 644,000 mt¹⁶. Therefore, the stock was not overfished, and overfishing was not occurring at this time. However, giving the uncertainties in the stock assessment pointed out in the 2010 TRAC report and the absence of recent stock assessment since 2006, the assessment team cannot consider that the US mackerel stock is highly likely to be within biologically based limits.

¹⁴ <http://www.mafmc.org/msb/>

¹⁵ <http://www.nero.noaa.gov/sustainable/species/msb/>

¹⁶ <http://www.nefsc.noaa.gov/sos/spsyn/pp/mackerel/>

Herring (fall spawner component)

Herring in the SGSL consist of a spring spawner component and a fall spawner component. SGSL herring are harvested by an inshore gillnet fleet on spawning grounds and a purse seine fleet (vessel > 65') in deeper waters. The TAC has been set separately for spring and fall fishing seasons since 1985. The 2011 TAC was 65,000 t and 2,000t for the fall spawner and the spring spawner, respectively. For both seasons, 77% of the TAC was allocated to the inshore gillnet fleet and 23% to the purse seine fleet. The spring fishery occurs in January-June and the fall fishery in July-December. SGSL lobster fishery is a spring (LFAs 23, 26A and 26B) and a summer/fall (LFA 25) fishery. According to lobster industry, in order to secure their bait supply and to be sure that the amount of herring for bait purpose is available before the starting of the lobster fishing season, lobster harvested use fall spawning herring from the fall inshore gillnet fishery (95% of the total catch of fall spawners) of the previous year and freeze the herring until the lobster fishing season of the following year.

The gillnet fleet harvests almost solely the spring spawner component in the spring, except for June, and solely the fall spawner component (99.9% of the total catch) in the fall (DFO 2012f).

A two-year SGSL Fall Herring Conservation and Harvesting Plan for 2012-2013 was issued by DFO in June 2012¹⁷. This plan includes a number of measures to ensure sustainable harvesting including input (gear characteristics, fishing season, fishing area) and output (quota allocations) controls.

For the fall spawning component, the limit reference point (B_{lim}) and the upper stock reference (B_{USR}) are 51,000 and 172,000 t respectively (DFO 2012f). As a result of the last stock assessment, the exploitation rate in 2011 was 21% below $F_{0.1}$ reference level of 25% and the 2012 beginning-of-year spawning stock biomass was estimated to be about 183,800 t above B_{USR} (Figure 83). Therefore, the stock is not overfished, and overfishing is not occurring.

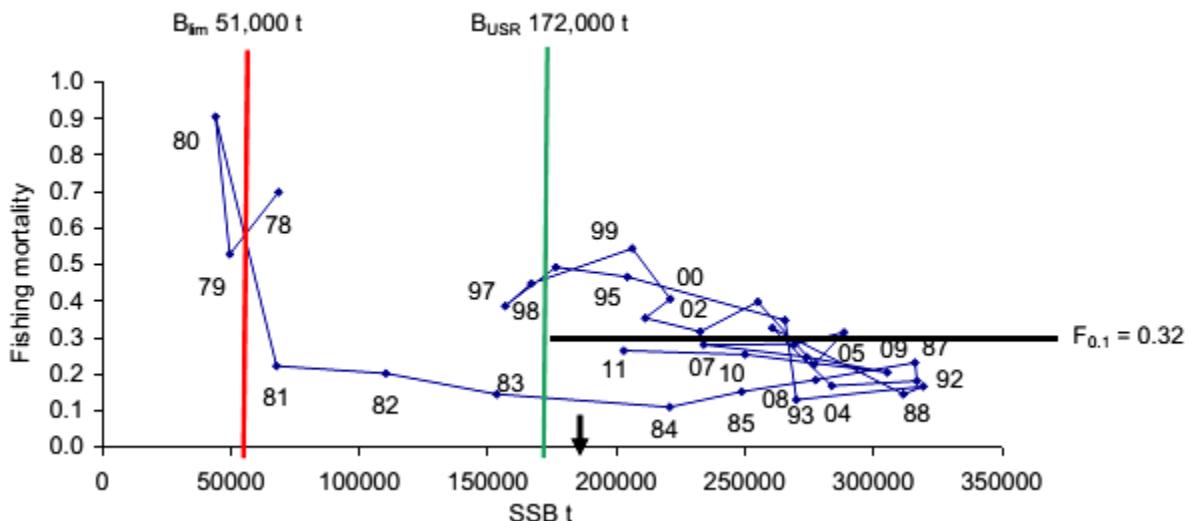


Figure 83. Fall spawner component biomass (ages 4+) and fishing rate (age 5-10) trajectory and reference points. The arrow indicates the 2012 SSB estimate of 183,800 t. Source: DFO 2012f.

¹⁷ <http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/Herring-Information/Herring-2012-2013-CHP>

Gaspereau and silverside

Gaspereau are the alewife (*Alosa pseudoharengus*) and the blueback herring (*Alosa aestivalis*), anadromous clupeids that frequent the rivers of the Maritimes. Gaspereau are harvested by gill, trap, and dip nets, and fisheries are managed under a 2000-2004 IFMP for gaspereau of Prince Edward Island¹⁸ and a six-year 2007-2012 IFMP for gaspereau of eastern New Brunswick¹⁹. Gaspereau fisheries are regulated by season, gear, and licence restrictions. Gaspereau landings in NB and NS were 1,942 t, 1,352 t and 1.943 t in 2010, 2011, and 2012, respectively (DFO Statistics²⁰). In the absence of specific biological and fisheries information, the management objective is to maintain harvest at about long-term mean levels. The reference point for SGSL gaspereau is defined on the basis of fishing mortality level which does not exceed the natural mortality rate (equivalent to exploitation rates of 0.33 and 0.39) (DFO 2001).

The Atlantic silverside (*Menidia menidia*) is a small schooling fish that ranges from the SGSL to Florida. The silverside fishery is prosecuted using box\trap net and is managed under a 2000-2004 IFMP²¹. Silverside fishery is regulated by season, gear and licence restrictions. Silverside landings in NS were 188 t, 86 t and 220 t in 2010, 2011, and 2012, respectively (DFO Statistics²²).

For the 2013 fishing season, a Lobster Logbook will be implemented and conditions will be attached to the licence. The Assessment team has been provided by DFO with a Draft of the lobster logbook licence conditions and a copy of the logbook. The licence holder is required to maintain a true and up-to-date record of all fishing activities and catches in the Lobster Logbook at the end of each lobster fishing day and provide a copy of all accurately completed logbooks to DFO at least once per week.

The following information will be record in the logbook:

- Licence holder, number, and vessel name,
- LFA, sub-LFA/Management zone,
- Date, landing port, fishing location,
- Traps hauled, soak days,
- Catches estimates in lbs of landed and/or used for bait of lobster, rock crab, cunner and sculpin.

The logbook will allow confirming that cunner, sculpin and rock crab are returned to the sea.

4.4.1.2. Maritimes Region (UoCs 2, 3, and 4)

All inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab (*Carcinus maenas*), rock crab (*Cancer irroratus*), and sculpin (*Myoxocephalus octodecemspinosus*). In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab (*Cancer borealis*) that is 130 mm and greater in length. However, in actual fishing practices, sculpin is not retained.

¹⁸ <http://www.inter.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2000-2004-Alewife-PEI>

¹⁹ <http://www.inter.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2007-2012-Alewives-ENB>

²⁰ <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2010aq-eng.htm>, <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2011aq-eng.htm>, <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2012aq-eng.htm>

²¹ <http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2000-2004-Silversides-PEI>

²² <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2010aq-eng.htm>, <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2011aq-eng.htm>, <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarg/sea-maritime/s2012aq-eng.htm>

If crab species are retained for the purpose of sale, the licence holder/operator is required to record and provide information in the Crab monitoring document (Crab 2002-12) regarding the fishing activities during each fishing trip and prior to returning to port. The licence holder is then required to supply a Dockside Monitoring Company with a copy of the report within 15 days after the end of each month during the Lobster fishing season. In contrast, Crab used for bait is to be reported in the Lobster log (DFO Maritimes during April 2014 site visit).

According to DFO Maritimes, reported green Crab, rock Crab, Jonah Crab, and Unspecified Crab landings retained by the inshore Lobster fishery of LFAs 27-38 for resale between 2010 to present has ranged from 0.8-1.6% of the total combined annual inshore landings for these Crab species reported to DFO Maritimes region over the same time period, with the maximum total annual combined landings of these Crab species between 2010 to present being 698 tonnes (this total is inclusive of all reported sources of inshore Crab landings for these species), which represented less than 1% of total lobster landings.

According to DFO, there have been no recent stock assessments for inshore rock Crab or inshore Jonah Crab, nor are assessments being planned for the two species during the upcoming year. Inshore Crabs were identified as secondary fishery stocks during a recent DFO review of primary/secondary fishery stocks. As a result, resources are not presently allocated to stock assessments for inshore rock Crab or inshore Jonah Crab. DFO's plan for secondary stocks is that the basis for management advice is provided through existing science surveys, industry survey results, fishery-dependent information, or habitat information (e.g. benthic classification). DFO reviews the Crab landings, as priority dictates and/or opportunity allows, to determine what information about these species can be learned.

Bait

CB3.5.5 The assessment team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.

According to lobster harvesters and den Heyer et al 2010, **the species used as bait in the NB and NS lobster fishery are Atlantic mackerel (*Scomber scombrus*), rock crab (*Cancer irroratus*) and herring (*Clupea harengus*)**. Harnish and Martin Willison (2008) examined lobster fishery bait-to-catch ratios in Nova Scotia. Results showed that the estimated amount of bait required to catch each lobster ranged from 185 g (November) to 1455 g (April) for average months during the 2002/03, 2003/04 and 2004/05 fishing seasons. The estimated amount of mackerel, rock crab and herring used as bait in 2012 was 8,153 t, 5,512 t and 7,601 t respectively, for all combined LFAs.

Rock crab and herring used as bait come from local fisheries. Mackerel used as bait comes from both Canadian and U.S. Atlantic mackerel fisheries.

Atlantic mackerel

Refer to the previous section.

Rock crab

According to DFO, there have been no recent stock assessments for inshore rock Crab or inshore Jonah Crab, nor are assessments being planned for the two species during the upcoming year. Inshore Crabs were identified as secondary fishery stocks during a recent DFO review of primary/secondary fishery

stocks. As a result, resources are not presently allocated to stock assessments for inshore rock Crab or inshore Jonah Crab. DFO's plan for secondary stocks is that the basis for management advice is provided through existing science surveys, industry survey results, fishery-dependent information, or habitat information (e.g. benthic classification). DFO reviews the Crab landings, as priority dictates and/or opportunity allows, to determine what information about these species can be learned.

The first rock/Jonah crab exploratory fishing permits were issued during 1995 in the Bay of Fundy (LFAs 36 and 38) and in 1996 in the Bay of Fundy (LFA 35) and southwest Nova Scotia (LFA 34) (Robichaud and Fail 2006). At the outset of these exploratory crab fisheries, several regulations were put in place in an attempt to prevent over-fishing and to protect the reproductive capacity of the crab population. These conservation measures were changed, replaced, or added to as these crab fisheries developed, as the fishermen became more experienced at catching crabs, and as scientific knowledge improved. In 2004, all of the exploratory crab permits became permanent commercial crab fishing licenses.

The crab fisheries are managed by effort control (input fishery). The most important measures in controlling effort are the limited entry of lobster fishing licences, trap allocation, restrictions on gear characteristics, and a limited fishing season. In addition to those management measures, other measures were implemented to protect key components of the crab populations. Female crabs are not allowed to be retained and there is a MLS. In addition escape vents are required to allow escapement of sublegal sizes (Robichaud and Fail 2006).

The current level of effort does not appear to have an impact on rock crab resource given the protection of brood stock provided by the MLS and the mandatory release of female crabs.

Herring

Herring fisheries in 4VWX have been dominated by purse seine (84-90%), followed by weir, gillnet, shutoff and trap, and are managed under the Scotia-Fundy Fisheries Integrated Herring Management Plan effective from 2003.

Landings for the 2010/2011 and 2011/2012 quota years were 50,010t and 47,614t against a Total Allowable Catch (TAC) of 50,000t each year for the SW Nova Scotia/Bay of Fundy component. Landings have tracked the TAC since 2002, with most of the quota being taken each year since 2002. In 2010, as a result of an industry decision late in the season 9,466t of quota was left in the. Since 2010, there have been self-imposed measures by industry to monitor and regulate catches of fish less than 18cm (DFO 2013f).

As a result of the last stock assessment, an increase occurred from the lower level observed in 2005-2010 for the SW Nova Scotia/Bay of Fundy spawning component. The overall biomass estimates have increased in 2011 and 2012, however, most of this growth has occurred in Scots Bay. The German Bank SSB fluctuated up in 2011 and down in 2012, representing essentially no change. The three-year moving average increased above the limit reference point in 2010, changed very little in 2011, and increased again in 2012 (Figure 82).

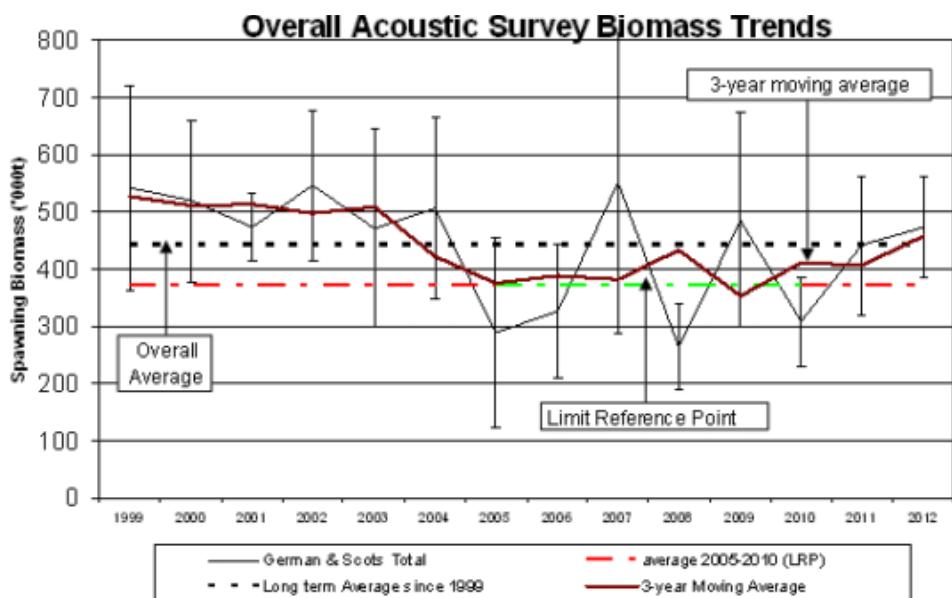


Figure 84. Relative spawning stock biomass index (with 95% standard errors), the calculated three year moving average, the long term average and the limit reference point for the SW Nova Scotia/Bay of Fundy spawning component (German Bank and Scots Bay). Source: DFO 2013f.

4.4.2. Bycatch species

As the nature and amount of bycatch are not recorded in the NB and NS lobster fishery, the Assessment team has proposed to score the PI 2.2.1 Bycatch Species Outcome using the MSC's RBF²³. However, RBF has not been used for the Maritimes UoCs as qualitative and some quantitative information on bycatch is collected occasionally.

4.4.2.1. Southern Gulf of St Lawrence (UoC 1)

The main bycatch species identified during the RBF meeting is the sculpin (*Myoxocephalus octodecemspinocus*).

The minor bycatch species identified during the RBF meeting are sea urchins and whelk.

Sculpin belongs to the family of Cottidae and is distributed from eastern Newfoundland to Virginia. They are found shallow coastal waters like estuaries down to a depth of 192 m (Comeau et al 2009). Smaller individual can escape from traps through the ring in the kitchen, but large individual cannot escape from the parlour (*pers. comm.* during RBF meeting). During the RBF and DFO meetings, the Assessment team has been told that decrease of abundance or size has not been observed and that there is no concern about this species.

²³ http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/bay-of-fundy-scotian-shelf-and-southern-gulf-of-st-lawrence-lobster-trap/assessment-downloads-1/20140311_Use_of_the_RBF_LOB428.pdf

Also, in 2012, one Atlantic minke whale was found dead entangled in a lobster trap. Although minke whale (*Balaenoptera acutorostrata*) is listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES)²⁴, this Canadian East Coast stock is not listed under the *Species at Risk Act* (SARA) and is considered not at risk under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)²⁵. According to MSC GCB3.11, Species listed under CITES Appendix 1 shall be considered ETP species, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered. Therefore, the assessment team assess the impact of the fishery on minke whale under bycatch species component (MSC CR CB3.11.2).

The minimum population estimate for the Canadian East Coast minke whale is 16,199 animals (Waring et al 2014). Potential Biological Removal (PBR) is the product of minimum population size, one-half the maximum productivity rate, and a recovery factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 16,199. The maximum productivity rate is 0.04, the default value for cetaceans. The recovery factor, which accounts for endangered, depleted, or threatened stocks, or stocks of unknown status, relative to optimum sustainable population (OSP) is assumed to be 0.5 because this stock is of unknown status. PBR for the Canadian east coast minke whale is 162 (Waring et al 2014).

Minke whale bycatch in the SGSL is by far lower than the PBR of 162.

There is a partial strategy in place to ensure that the NB and NS lobster fishery does not pose a risk or irreversible harm to bycatch species populations: the seasonality of the fishery, the limited number of licences and traps, the requirement of escape vent and modified biodegradable panels will be required for the 2013 fishing season (DFO 2012c) for all LFAs in the SGSL, reducing non-target species catch and impacts from lost traps (“ghost fishing”), and the requirement of a minimum of 6 traps per line in LFA 26A and fishing practices in LFA 25 (traps set per line even not required) reducing the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals. Moreover, the Assessment team considered that the strategy of fishing effort reduction adopted by DFO from 1998 to 2006 and after 2009 through licence retirement (reducing the number of harvesters), reduction of the number of traps per licence and fishing only six days per week would have reduced bycatches. Individuals are immediately and carefully returned to the water, and survival is thought to be high for fish and shellfish species.

4.4.2.2. Maritimes Region (UoC 2, 3 and 4)

During site visit meetings, the lobster harvesters and DFO pointed out the very low amount of bycatch species.

As part of their Science Activities which include research and monitoring of lobster in the LFA 27, LFA 27 Management Board conducts at sea-sampling to record incidental catch since 2011 (Brzeski 2014). 27, 38, 45 and 75 at-sea samples were taken during the lobster fishing season in 2011, 2012, 2013 and 2014, respectively.

The Guysborough County Inshore Fishermen's Association has been recording incidental catch (in number) for LFAs 31a and 31b since 2009 (Delorey 2013). The data is collected throughout the fishing

²⁴ <http://www.cites.org/eng/app/appendices.php>

²⁵ http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=894

season (May and June for LFA 31a and April and May for LFA 31b) during at sea samples. The study showed that the mean percentage of all non-lobster species caught in lobster traps was 11%, and 4.3% for LFA 31a and LFA 31b, respectively; and the mean percentage of non-lobster species minus rock crab, green crab and sculpin (that are allowed to be landed by licence conditions) was 9% and 1.3% (Delorney 2013).

The catch of 41 lobster fishing trips were sampled at-sea by the FSRS between November 2005 and July 2006 in UoC 2 area. As a result, more than 90% of the catch, by weight and number, was lobster (den Heyer et al. 2010). None of the bycatch species represented 5% or more than 5% of the lobster catches. 44 species from 9 phyla were caught in the commercial lobster traps sampled (n=2553). Most lobster traps caught 1 or 2 species but some caught as many as 6 species. The most commonly caught species in lobster traps were decapods. 23% of traps caught rock crab, 10% Jonah crab, 2% hermit crabs (Paguridae) and 2% toad crabs (*Hyas spp.*). Six per cent of traps caught sea urchins (*Strongylocentrotus*), 5% caught starfish (*Asterias spp.*), 5% caught whelks (*Buccinum spp.*) and 1% caught periwinkles (Littorinidae). Six per cent of traps caught shorthorn sculpin (*Myoxocephalus scorpius*), and almost 1% of traps caught cunner (*Tautogolabrus adspersus*), sea raven (*Hemitripterus americanus*), longhorn sculpin (*Myoxocephalus octodecemspinosis*), cod (*Gadus morhua*) and winter flounder (*Pseudopleuronectes americanus*).

The estimate catch of cod during 2005-2006 was 145.8 t, which represented 1.8% of UoC 2 total catch.

The Maritimes Region lobster fisheries were at-sea sampled as part of the Species at Risk (SARA) bycatch study, for levels of incidental catches during 2009-2010 lobster fishing season (Pezzack et al 2014). A total of 552 samples were taken on 370 vessels. The results showed that the non-lobster portion of the total catch ranges from 1.5% in LFA 31B to 13% in LFA 33. If legally retained crab species are not included, bycatches range from 0.1% (LAF 32) to 7.5% (LFA 33). The conclusion of this study was that the overall incidental catch, with exception of the crab species, was low.

This study showed that 125 t and 210 t of cod were caught by lobster harvesters in LFAs 27-33 (UoC 2) and LFA 34 (UoC 3), respectively. These catches represented 0.4 % and 1% of the total catch in UoC 2 and UoC 3, respectively.

Pezzack et al (2014) also showed that 8 t and 219 t of cusk were caught by lobster harvesters in LFAs 27-33 (UoC 2) and LFA 34 (UoC 3), respectively. These catches represented 0.03 % and 1.1% of the total catch in UoC 2 and UoC 3, respectively. A special sampling project was undertaken to estimate cusk bycatch in LFA 34 lobster fishery (Harris and Hanke 2010). Results show that 461 t and 344 t of cusk were caught during the 2005-2006 and 2006-2007 fishing seasons, respectively. These catches represented 2.7% and 2% of the total catch during the 2005-2006 and 2006-2007 fishing seasons, respectively.

Although no SARA sampling was completing for LFAs 35-38 (UoC 4), qualitative and some quantitative information on bycatch is available from at-sea samples (Trembley et al 2013). If legally retained crab species are not included, bycatches are estimated to be approximately 1% of the total catch, and include sculpin, cod, cusk, hermit crab, flounder, and whelk (DFO 2014f, lobster harvesters and DFO during 2014 site visit).

Although cod and cusk catches represent less than 5% of the total catch, the assessment team considers cusk and cod as main bycatch species due to the vulnerability of the species (MSC GCB3.5.2.).

The Laurentian South cod population is considered as endangered under COSEWIC, and is not listed under SARA but is under consideration²⁶. The most recent 4X5Yb cod stock assessment showed that the SSB of 10,600 t was below the limit reference point of 24,000 t (DFO 2015).

Based on the nature of the lobster fishery, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cod: lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps has been reduced over the years. There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and evidence from tagging studies that indicate cod survive after being captured and released from lobster traps (DFO 2005a, Taggart et al 1995).

Cusk is considered as threatened under the COSEWIC and is not listed under the SARA²⁷. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the LRP for the last 3 years (DFO 2014e), and it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years (DFO 2014d).

Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cusk: cusk were legally landed from the lobster fisheries until 1999 (Harris and Hanke 2010), then from this date cusk were not allowed to be retained. Also, lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps was reduced over the years. There is evidence that this partial strategy works based on the fact that cusk bycatch estimates are well below the 5% threshold, much lower than catches observed in groundfish longline fisheries in 4X5Z, and as mentioned above, it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years (DFO 2014d).

Also two minke whales were entangled in lobster trap, one died and the fate of the other was unknown. The assessment team considers that there is a strategy in place to minimize impact of lobster fisheries on minke whale: the seasonality of all lobster fisheries, limited numbers of licences and traps, traps has been reduced over the years, and voluntary industry projects in LFA 33, 34 and the Bay of Fundy have been implemented to minimize mortality of marine mammals.

Minke whale bycatch in the Maritimes is by far lower than the PBR of 162.

²⁶ http://www.dfo-mpo.gc.ca/species-especies/species-especies/atlanticcod-morue_laurentian-laurentienne_south-sud-eng.htm

²⁷ <http://www.dfo-mpo.gc.ca/species-especies/species-especies/cusk-brosme-eng.htm>

4.4.3. ETP species (for all UoCs)

According to MSC (CB3.11.1 and GCB3.11.1), 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), unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered. 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^{28,29,30}

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.

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 will:

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

²⁸ http://www.sararegistry.gc.ca/approach/act/sara_e.pdf

²⁹ http://www.cosewic.gc.ca/eng/sct6/sct6_3_e.cfm#hist

³⁰ http://www.sararegistry.gc.ca/approach/strategy/Framework_e.cfm

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 the following diagram. 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.

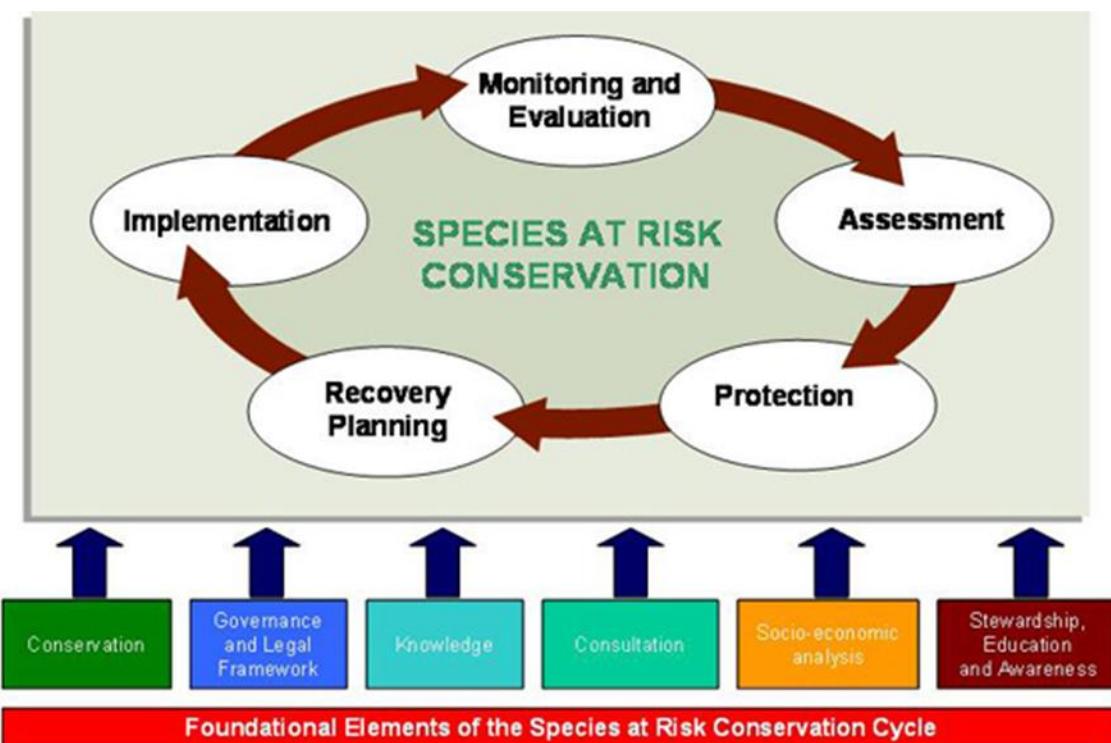


Figure 85. Diagram showing the *Species at Risk* conservation process.

Under the SARA, species are classified according to status, namely **extinct, extirpated, endangered, threatened or special concern**³¹.

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

³¹ http://www.sararegistry.gc.ca/species/default_e.cfm

their habitats in order to ensure that they do not become threatened or endangered due to human activity.

Wolfish

In accordance with the recovery strategy for the Northern wolfish, the spotted wolfish and 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 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 wolfish or a spotted wolfish or a leatherback turtle or a striped bass returns it, without delay, to the water in which it was caught and, if the fish or 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 in the *Species at Risk – Logbook*.

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

The Atlantic wolfish (*Anarhichas lupus*) 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*³². However, as species listed as special concern are not subject to any prohibition, fish harvesters are not required to provide information on its catch in the *Species at Risk – Logbook*, but NB and NS lobster harvesters provide this information to DFO (Table 46 and Table 47).

Under the *SARA*, a Management Plan has been implemented (Kulka et al 2007).

From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf (Table 46).

From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes (Table 47).

Table 46. ETP fish and turtle species catches in the NB and NB Gulf lobster trap fishery from 2007 to 2011. Source: DFO Gulf.

Year	Spotted Wolfish	Northern Wolfish	Leatherback Turtle	Other species
2007	2 (alive)	4 (alive)		1 Atlantic Wolfish (alive)
2008	2 (alive)			1 Atlantic Wolfish (alive)
2009				7 Atlantic Wolfish (alive)
2010		1 (alive)		
2012		Number not given (alive)		

³² <http://www.dfo-mpo.gc.ca/species-especes/species-especies/wolfish-loup-at-eng.htm>

Table 47. SARA species encounters for those LFAs in Maritimes that have reported encounters from 2010 to 2012. Source: data provided by DFO Maritimes.

Lobster Fishing Area (LFA)	Species	SARA Encounters		
		2010/2011	2011/2012	Total
27	Wolfish, Northern	8	4	12
27	Wolfish, Spotted		2	2
31A	Wolfish, Striped/Atlantic	2		2
32	Wolfish, Striped/Atlantic	1		1
33	Wolfish, Northern		9	9
33	Wolfish, Spotted		6	6
34	Wolfish, Striped/Atlantic	1		1
Total		12	21	33

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 in the *Species at Risk – Logbook*.

Under the *SARA*, a recovery strategy has been implemented for the leatherback turtle (Atlantic Leatherback Turtle Recovery Team 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 risk³³.

Satellite telemetry data from 70 leatherback turtles tracked in Atlantic Canadian waters were used to identify important habitat for the species (DFO 2012h). This is the single largest telemetry dataset for 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 86).

³³ <http://www.iucnredlist.org/search>

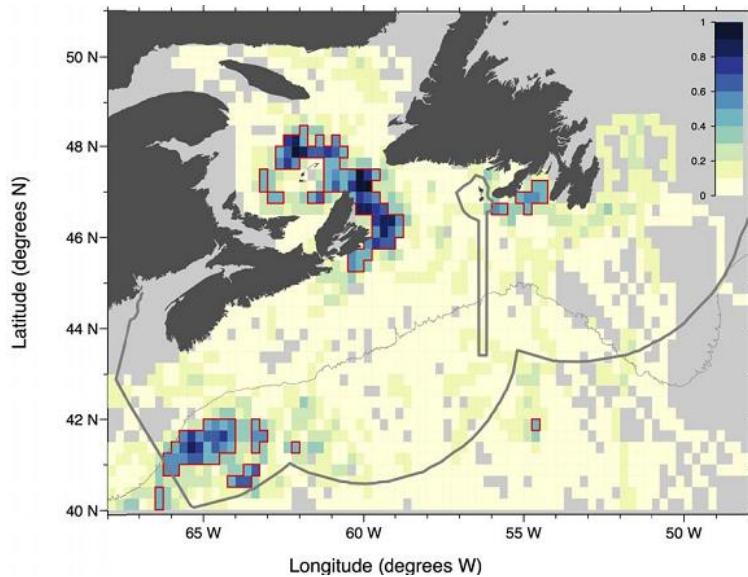


Figure 86. Relative probability of residency estimated from 70 leatherback turtles equipped with satellite tags. Note that all but those areas shaded in light grey were sampled by turtles. Red polygons denote areas where aggregated residency probabilities ≥ 0.4 for all satellite tracked turtles. Thick grey line indicates Atlantic Canadian EEZ boundary, thin grey line indicates 1000 m isobaths. Source: DFO 2012h.

Figure 86 shows that the relative probability of residency of leatherbacks in the LFAs 23, 25, 26A and 26B; Bay of Fundy, eastern and southwestern Scotian Shelf is low. However, it was noted that notable areas not sampled by tagged turtles included Northumberland Strait and Bay of Fundy (Figure 86, light grey areas). But the author of the analysis pointed out that while opportunistic sightings of leatherbacks have occurred in this area, such records are rare relative to those corresponding to the high-use areas identified via satellite telemetry.

Although the probability of residency of leatherbacks in Cape Breton area is high (Figure 86), no leatherback turtle catches in lobster trap have been reported in the UoC 2 area. No leatherback turtle catches have been reported in UoCs 1, 3 and 4 areas either.

Marine mammal species

Table 48 shows the ETP marine mammals species with possible interaction with the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster fisheries.

Table 48. Marine mammal species with possible interactions with the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster fisheries, their status under the COSEWIC and the SARA are given³⁴. It is also specified if the species is listed in the Appendix 1 of the CITES³⁵.

Common name	Scientific mane	COSEWIC Status	SARA Status	Appendix 1 of the CITES
Atlantic walrus	<i>Odobenus rosmarus</i>	Special concern	No status	No
Grey seal	<i>Halichoreus grypus</i>	Not at risk	No status	No
Harbour seal				
Atlantic and Eastern Artic species	<i>Phoca vitulina concolor</i>	Not at risk	No status	No
Blue whale Atlantic	<i>Balaenoptera musculus</i>	Endangered	Endangered	Yes
Fin whale Atlantic	<i>Balaenoptera physalus</i>	Special concern	Special concern	Yes
North Atlantic Right Whale	<i>Eubalaena glacialis</i>	Endangered	Endangered	Yes
Humpback whale Western North Atlantic	<i>Megaptera novaeanglia</i>	Not a risk	Special concern	Yes

The Western north Atlantic right whale population is located in the Southern (Florida, Georgia), winter portion of the range (DFO 2007c). Late winter and spring feeding aggregations of right whales are observed in Cape Cod Bay Massachusetts Bay and the Great South Channel. Then from June through October as many as two-thirds of the North Atlantic right whale population migrate to feeding grounds in New England waters and Canadian Bay of Fundy, Scotian Shelf, and Gulf of St Lawrence (Waring et al 2014). In Canadian waters, during the summer and early autumn, concentrations of foraging right whales are seen in Grand Manan Basin in the Bay of Fundy and in Roseway Basin (southwestern Scotian Shelf), which have been established as right whale Conservation Area (Figure 87).

The western North Atlantic minimum stock size is based on a census of individual whales identified using photo-identification techniques. A review of the photo-ID recapture database as it existed on 29 October 2012 indicated that 455 individually recognized whales in the catalogue were known to be alive during 2010. This value is a minimum, and does not include animals that were alive prior to 2008 but not recorded in the individual sightings database as seen during 1 December 2008 to 29 October 2012.

Examination of the minimum number alive population index calculated from the individual sightings database, as it existed on 21 October 2011, for the years 1990-2010 suggests a positive and slowly

³⁴ <http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm>

³⁵ <http://www.cites.org/eng/resources/pub/checklist11/Appendices.pdf>

accelerating trend in population size (Waring et al 2014). These data reveal a significant increase in the number of catalogued whales with a geometric mean growth rate for the period of 2.8%.

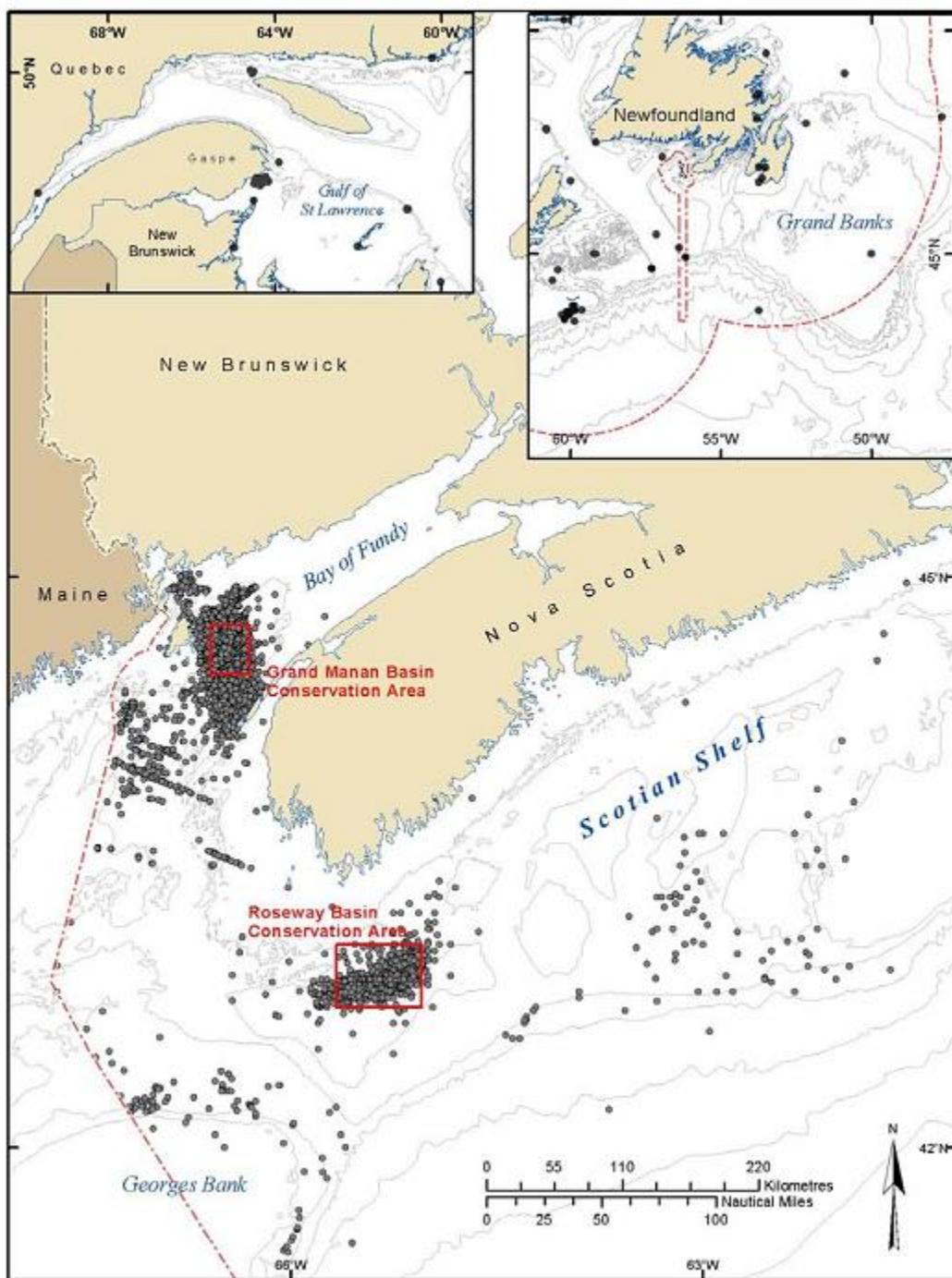


Figure 87. Canadian range of the North Atlantic right whale: 1951-2005, based on individual right whale sighting (dots) from the North Atlantic Right Whale Consortium 1951-2005, the St. Andrew Biological whale sighting database 1992-2005 and the DFO Newfoundland Region whale sighting database 1975-2003. Red dotted lines are the boundaries EEZ of Canada, the United States and St. Pierre et Miquelon (France). (Prepared by Oceans and Coastal Management Division, DFO). Source: Brown et al 2008.

A Recovery Strategy for the North Atlantic right whale in Atlantic Canadian waters has been proposed (Brown et al 2008).

The Canadian blue whale population in the Atlantic belongs to the Northwest Atlantic population. North Atlantic blue whales undertake long seasonal migrations, south to north, from their wintering areas in equatorial latitudes to summer feeding areas located in productive waters of temperate to subarctic latitudes (Beauchamp et al 2009).

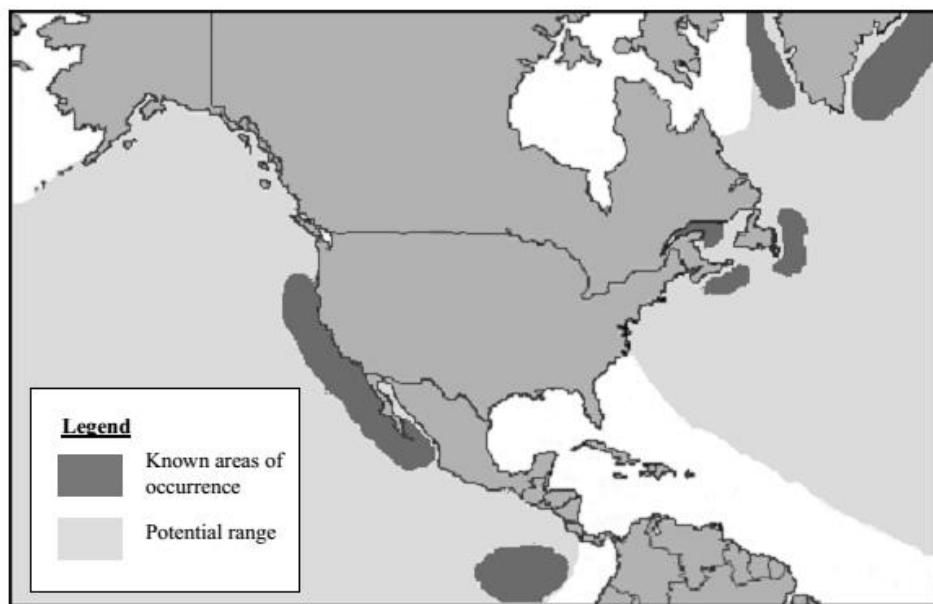


Figure 88. Geographical range of the blue whale, along the coast of North and Central Americas. Adapted from Sears and Calambokidis (2002). Source: Beauchamp et al 2009.

The number of blue whales in the North Atlantic population is unknown, but it would be unlikely this population comprises more than 250 individuals that have reached sexual maturity. The most important factor responsible for the low numbers of blue whales in Canada is historical whaling, which decimated populations from the end of the 19th century until it was prohibited by the International Whaling Commission (IWC) in 1966. Accidental entanglements in fishing gear was classified as low-risk anthropogenic threats in comparison with whale watching and collisions with vessels which were classified as medium-risk anthropogenic threats, and acoustic environmental degradation and food availability which were classified as high-risk anthropogenic threats (Beauchamp et al 2009).

A Recovery Strategy for the blue whale, Northwest Atlantic population in Canada has been finalized (Beauchamp et al 2009).

Fin whales are found in all oceans of the world, with the exception of the Arctic. Fin whales off eastern U.S., Nova Scotia and the southeastern coast of Newfoundland (Figure 89) are believed to constitute a single stock, the western north Atlantic stock, under the present International Whaling Commission scheme (Warin et al 2014). However, whether the current stock boundaries define biologically isolated units has long been uncertain. During the summer, fin whales can be found in areas of krill concentration, such as oceanic front off Newfoundland, and turbulence areas in the Bay of Fundy (Figure 89).

The best abundance estimate available for the western North Atlantic fin whale stock is 3,522 (CV=0.27). This is the estimate derived from the Canadian Trans-North Atlantic Sighting Survey (TNASS) in July–August 2007 and is considered best because it covered more of the fin whale range than the other surveys. The minimum population estimate for the western north Atlantic fin whale is 2,817.

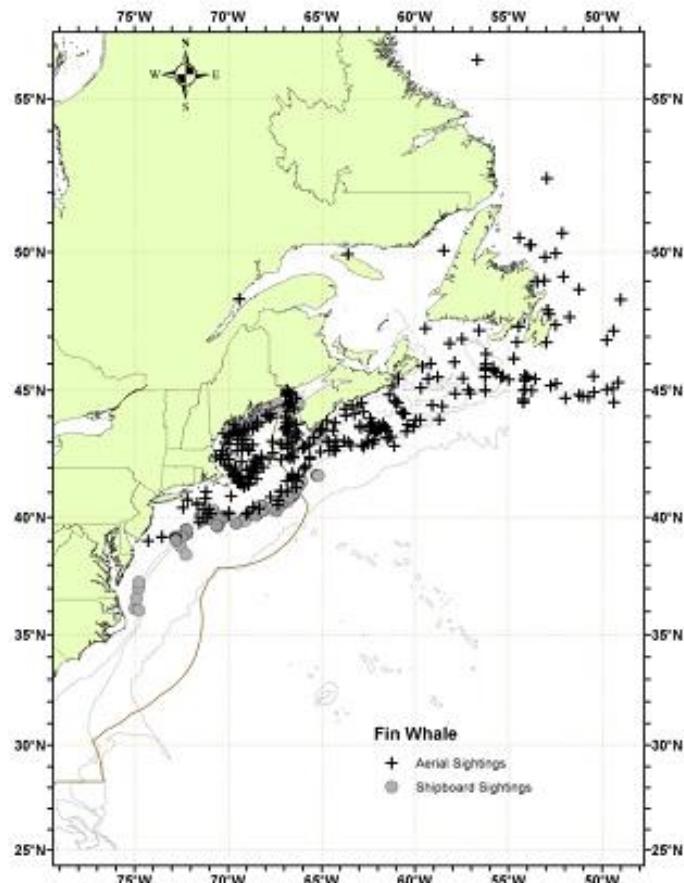


Figure 89. Distribution of fin whale sightings from NEFSC and SEFSC shipboard and aerial survey during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011 and DFO's 2007 TNASS survey. Source: Waring et al 2014.

The most important threat is noise pollution, caused by shipping, seismic exploration, military sonar and industrial development. Other important threats are changes in food availability, toxic spills, whaling – still occurring in Greenland and Iceland – and diseases. Some less important threats which need to be monitored include ship strikes, entanglements in fishing gear, marine life observation activities and harmful algal blooms³⁶.

A management plan is being drafted for fin whale. Furthermore, a moratorium on harvesting forage species, such as frill, has been put in place by DFO, to protect food supplies of marine mammal species at risk such as the fin whale³⁷.

³⁶ <http://www.dfo-mpo.gc.ca/species-especies/species-esp/finwhale-atlantic-rorqual-commun-atlantique-eng.htm>

³⁷ <http://www.dfo-mpo.gc.ca/species-especies/species-esp/finwhale-atlantic-rorqual-commun-atlantique-eng.htm>

In the western North Atlantic, humpback whales feed during spring, summer, and fall over a geographical area encompassing the eastern coast of the U.S., including the Gulf of Maine, the Gulf of St Lawrence, Newfoundland/Labrador and western Greenland (Waring et al 2014). During winter, humpback whales from most North Atlantic feeding areas mate and calve in the West Indies.

An abundance estimate of 847 animals ($CV=0.55$) was derived from a line-transect sighting survey conducted during August 2006, which covered 10,676 km of trackline from the 2000-m depth contour on the southern edge of Georges Bank to the upper Bay of Fundy and to the Gulf of St. Lawrence (Waring et al 2014). The most recent available data suggest that the Gulf of Maine humpback whale stock is characterized by a positive trend in size. This is consistent with an estimated average trend of 3.1% ($SE=0.005$) in the North Atlantic population overall for the period 1979-1993, although there are no feeding area-specific estimates.

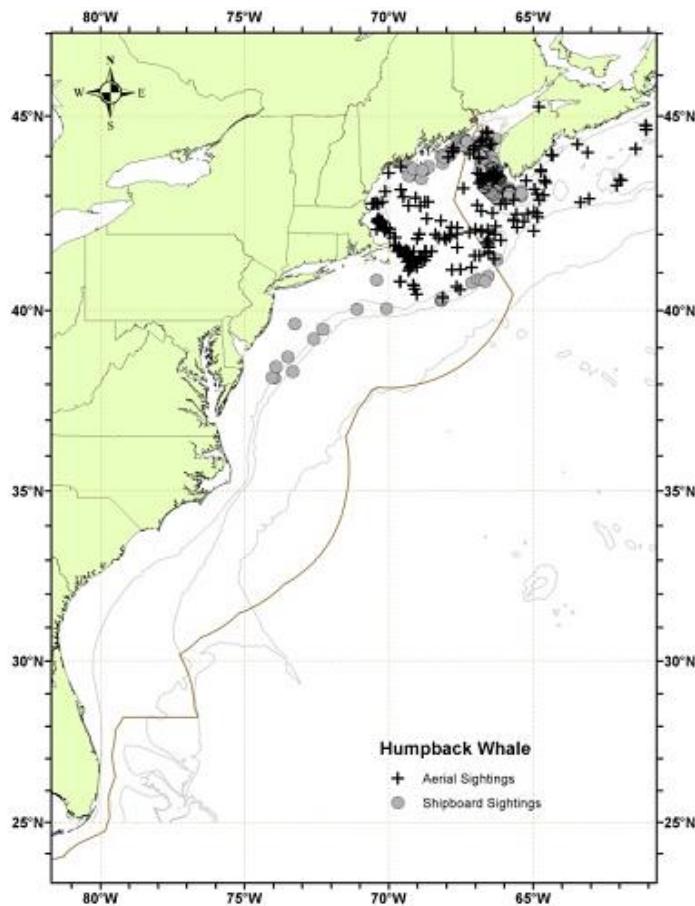


Figure 90. Distribution of humpback whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summer of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Source: Waring et al 2014.

Risk posed by the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster fisheries to ETP marine mammals

Information from the Marine Mammal Response Program from 2011-2014

In Gulf Region (UoC 1): in 2011, one unidentified whale species was reported entangled in lobster traps and was successfully released alive.

In the Maritimes Region (UoCs 2, 3, 4): one humpback whale, whose Western North Atlantic population is listed as special concern under SARA, was reported entangled in lobster trap and successfully released alive.

Information from Warning et al 2014

North Atlantic right whale

From 2007 through 2011, 17 of 21 records of mortality or serious injury, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 17 records, 4 were located in Canada (Table 49).

Table 49. Entanglement of North Atlantic right whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
8/9/09	Serious injury	Bay of Fundy, XC	None present
8/12/10	Mortality	Digby Neck Nova Scotia, XC	None present
9/3/11	Serious injury	Gaspe Bay, XC	None present
9/27/11	Unknown	Grand Manan Island, Bay of Fundy, XC	None recovered/received

Among these 4 records, gear type was either unknown, or not recorded or not recovered. One record was in Gaspe which is not part of any of the UoCs under the current assessment. All records occurred in August and September when lobster fishing seasons are closed except in the LFA 25 (Southern Gulf of St Lawrence) where the lobster finings season lasts from mid-August to mid-October, and in LFA 38B (Grey Zone) where the fishing season if from June 30 to 2nd Tuesday of November.

Humpback whale

From 2007 through 2011, 53 of 63 records of dead or injured humpback whale, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 53 records, 7 were located in Canada (Table 50).

Table 50. Entanglement of humpback whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
9/20/08	Unknown	Brier Island Nova Scotia, XC	None recovered/received
11/8/08	Unknown	Nova Scotia, XC	None recovered/received
9/12/09	Unknown	White Island Nova Scotia, XC	Weir
9/16/09	Unknown	Outside Halifax Harbor, XC	None recovered/received
9/10/10	Unknown	Grand Manan Bay of Fundy, XC	None recovered/received

11/27/10	Mortality	Bay of Fundy, XC	None recovered/received
10/10/11	Serious injury	Grand Manan Bay of Fundy	None recovered/received

Among these 7 records, the gear involved (weir) has been identified in only one case. 4 records were in September when lobster fishing seasons along the Scotian Shelf and Bay of Fundy are closed, except in LFA38B. One record in Bay of Fundy was in October when the lobster fishing season is closed except in LFA 35 and LFA 38B. 2 records were in November when the lobster fishing season is closed along the Scotian Shelf and open in the Bay of Fundy.

Fin whale

From 2007 through 2011, 13 of 20 records of dead or injured fin whale, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 13 records, 4 were located in Canada (Table 51).

Table 51. Entanglement of fin whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
9/9/09	Unknown	Between Campobello and Wolves Island, Bay of Fundy, XC	None recovered/received
10/9/09	Unknown	Long Island Nova Scotia, XC	Gear unidentifiable
7/2/11	Serious injury	Between Anticosti Island and North Shore, Gulf of St Lawrence, Canada	None recovered/received
7/24/11	Mortality	Cheticamp Nova Scotia, Canada	None present

For all these 4 records in Canadian waters, the fishing gear was none present/recovered or unidentifiable. The record in the Bay of Fundy occurred in September when the lobster fishing season is closed except in LFA38B. The record in Long Island occurred in October when the lobster fishing season is closed in LFA 34. Anticosti Island and the North Shore are located in the North part of the Gulf of St Lawrence which is not part of the current assessment. The record in Cheticamp occurred in July when the lobster fishing season is closed in all LFAs of the Southern Gulf of St Lawrence and in most LFAs of the Scotian Shelf (except LFAs 27 and 30 where the fishing season ends mid-July).

Conclusion

While there is a potential for interaction between lobster gear and whales, the seasonality of the lobster fisheries and the times and areas of known whale concentrations result in low potential for interactions. Although the assessment team acknowledges the lobster fishing season in the Grey Zone, LFA 38B, lasts from June to November and therefore overlaps with months right whale are present in the Bay of Fundy, both Canadian and U.S lobster harvesters fish in this Zone, U.S. harvesters fishing year-round. All the LFA 38 lobster licence holders (136 licences) are eligible to fish in the Grey Zone, but the average number of Canadian fishing boats operating in the Grey Zone has been closer to 20-25 each summer (DFO Maritimes, *pers. comm.*, April 2015). Moreover, Johnson et al (2007) show that the groundfish gillnet and groundfish hook and line fisheries likely pose the greatest risk for right whale entanglements. These fisheries made up the bulk of fishing effort in Scotia-Fundy between the months of June and

October when the highest densities of right whales occur, and sets were widely distributed throughout the region. There was also no indication of potential overlap of right whale and lobster trap gear in the vicinity of either whale Conservation Zone.

Regarding the Gulf of St Lawrence, there is low or no overlap between the presence of right whale and the SGSL lobster trap fishery. The highest concentration of right whale occurs in Gaspé Peninsula (Figure 87) which is not part of the UoCs currently under assessment. Moreover, there is no lobster fishing activities in the SGGSL during the summer and the fall, except in LFA 25 where the lobster fishing season lasts from mid-August to mid-October.

Based on the evidence provided, the assessment team evaluated that it is highly likely that the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries do not pose a risk of serious or irreversible harm to ETP species and do not hinder recovery of ETP species.

The assessment team considers that there is a strategy in place to minimize impact of lobster fisheries on ETP marine mammal and sea turtle species: the reporting of interactions with ETP species is mandatory, recovery strategies and management plans are proposed, the seasonality of all lobster fisheries, the limited numbers of licences and traps, the requirement of a minimum of 6 traps per trap line in LFA 26A and fishing practices in place in LFAs 25 (traps set per lines even if not required) reduces the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals and sea turtles, voluntary industry projects in LFA 33, 34 to reduce excess line in the water column for the protection of right whales have been implemented in 2009 in cooperation with WWF Canada, the Fundy North Fishermen's Association voluntary completed a ghost gear and marine debris removal at the mouth of the Bay of Fundy in summer and fall 2013 to reduce threats to marine mammals due to lost gears, a right whale voluntary mitigation strategy was implemented for the first time in LFAs 36 and 38 in 2007, this strategy is reviewed annually and remains in practice (Brown et al 2008 and <http://gmfa.nb.ca/wp-content/uploads/2012/09/Right-Whale-Mitigation-Strategy-2013.pdf>).

4.4.4. Habitat (for all UoCs)

Legislative and Policy framework

On June 29, 2013 amendments to the *Fisheries Act* have been approved. The Fisheries Protection Program and its Policy Statements (November 2013) support changes made to the *Fisheries Act*. The mandate of the Fisheries Protection Program is to maintain the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries³⁸. The Fisheries Protection Policy Statement (FPPS) focuses on the management of impacts to fish resulting from habitats degradation or loss and alterations to fish passage and flow.

Through the FPPS, DFO objectives are to provide consistent guidance through regulations, standards and directives, and to make regulatory decisions in a timely manner. In this way, proponents will have the necessary information and direction to avoid, mitigate and offset harmful impacts to fish and fish

³⁸ <http://www.dfo-mpo.gc.ca/pnw-ppe/fpp-ppp/index-eng.html>

habitat so that they will meet the goal of this policy, and thereby comply with the fisheries protection provisions of the *Fisheries Act*.

The prohibition against *serious harm to fish* applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the *Fisheries Act* prohibits *serious harm to fish* which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”.

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

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

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

DFO interprets serious harm to fish as:

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

In 2009, DFO published the *Policy for Managing the Impact of Fishing on Sensitive Benthic Areas* under the auspices of the Sustainable Fisheries Framework in response to the 2006 United Nations Resolution 61/105³⁹. The purpose of the policy is to help DFO manage fisheries to mitigate impacts of fishing on sensitive benthic habitats or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species. This national policy applies to all commercial, recreational and Aboriginal fishing activities licenced and/or managed pursuant to the *Fisheries Act* and the *Coastal Fisheries Protection Act*, including fishing inside and outside of Canada’s EEZ.

A key tool for use in the implementation of the policy is the Ecological Risk Assessment Framework⁴⁰ 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 coldwater 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

³⁹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthic-eng.htm>, <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-back-fiche-eng.html>

⁴⁰ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-eng.pdf>

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

Marine Protected Areas (MPAs)

There are a number of MPAs designated under the *Ocean Act* (1996), including several areas of interest that are at various stages of progress towards designation⁴¹. These areas are ecologically significant, with species and/or properties that require special consideration.

MPAs are one among various other management tools that contribute to the improved health, integrity and productivity of Canada's marine ecosystems and help advance integrated ocean management. These areas are part of Canada's network of MPAs.

The MPA designation process includes public input to determine the costs and benefits of MPA designation. Areas of Interest (AOI) are identified and will undergo a detailed biophysical and socio-economic evaluation and public consultations before a decision is made to formally designate it as a Marine Protected Area. Consultation with First Nations, stakeholders, industry and interested groups will provide opportunities to contribute to the evaluation and analysis of impacts of MPA designation, establishment of appropriate conservation and management objectives, and development of the regulatory package.

Bassin Head is a shallow coastal lagoon located on the eastern tip of PEI. Based on extensive public and government input and interest, DFO announced the designation of the Bassin Head MPA in October 2005⁴². Bassin Head is a unique coastal environment with high levels of productivity and biodiversity. It is a small estuarine lagoon comprised of an entrance channel, a lagoon, and a long narrow channel that

⁴¹ <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm>

⁴² <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/factsheets-feuillets/basinhead-eng.htm>

extends parallel to the coast. The MPA includes waters under federal jurisdiction and three internal management zones (Figure 91): the lagoon (Zone 1), the inner channel (Zone 2) and the outer coastal zone (Zone 3). The Regulations contain a general prohibition against the disturbance, damage, destruction or removal of any living marine organism or any part of its habitat within the MPA. Further, the Regulations recognize that certain activities, such as scientific research and specific types of fishing, may cross the harm threshold but still may be allowed to occur within the MPA without compromising the conservation objectives under specific conditions. Aboriginal Peoples fishing in accordance with the Aboriginal Communal Fishing Licenses Regulations will be permitted throughout the MPA.

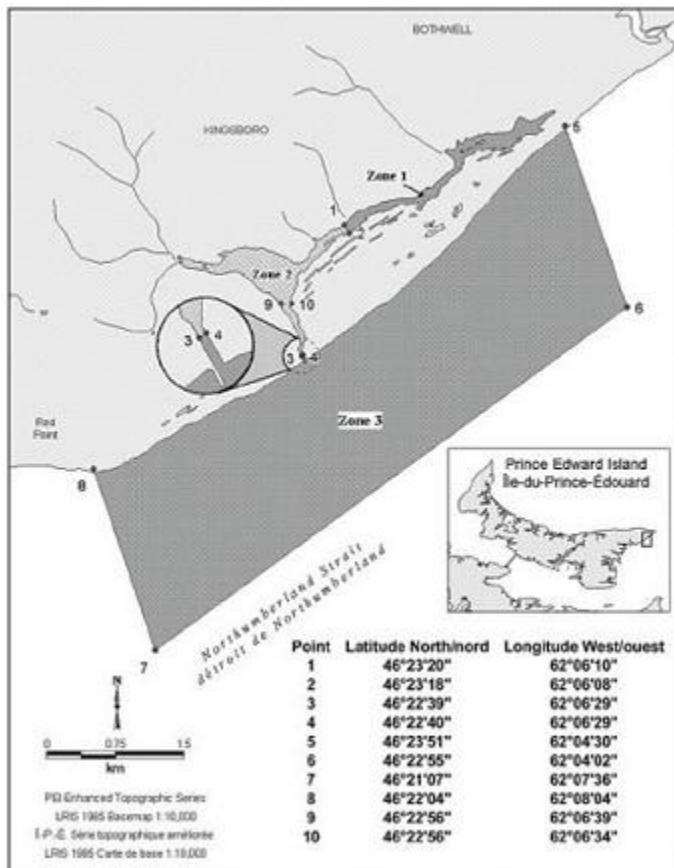


Figure 91. Bassin Head Marine Protected Area. Source: <http://laws-lois.justice.gc.ca/PDF/SOR-2005-293.pdf>

Shediac Valley has been designated Areas of Interest for possible inclusion in a network of Marine Protected Areas under Canada's Oceans Act. The Shediac Valley Area is a candidate Marine Protected Area (MPA), which would provide comprehensive and long-term management and protection for this area rich in biodiversity. The Shediac Valley AOI is an area rich in biodiversity in the SGSL and is recognized as having high productivity with circular currents (gyres) located near the north and south borders. Water depths in the Area of Interest range from 24 to 51 metres⁴³. It is located east of New

⁴³ <http://www.dfo-mpo.gc.ca/media/back-fiche/2011/hq-ac10b-eng.htm>

Brunswick and north-west of Prince Edward Island and covers an area of 1530 km². The area plays an important role in various biological functions (feeding, refuge, nursery and spawning) for a variety of fish species including many commercial species. In particular, it is used by Atlantic cod particularly for summer feeding and as a nursery ground. Other species of conservation interest are also in the area, such as American Plaice and Winter Skate. Protection of this area will contribute to the survival and recovery of healthy and abundant aquatic resources⁴⁴.

Although a portion of the Shédiac Valley is closed to groundfish fisheries, the closure is renewed on a yearly basis by the Department. Furthermore, the closure does not protect the site from other potential activities. A Marine Protected Area designation would ensure longer term protection from a wide variety of human activities.

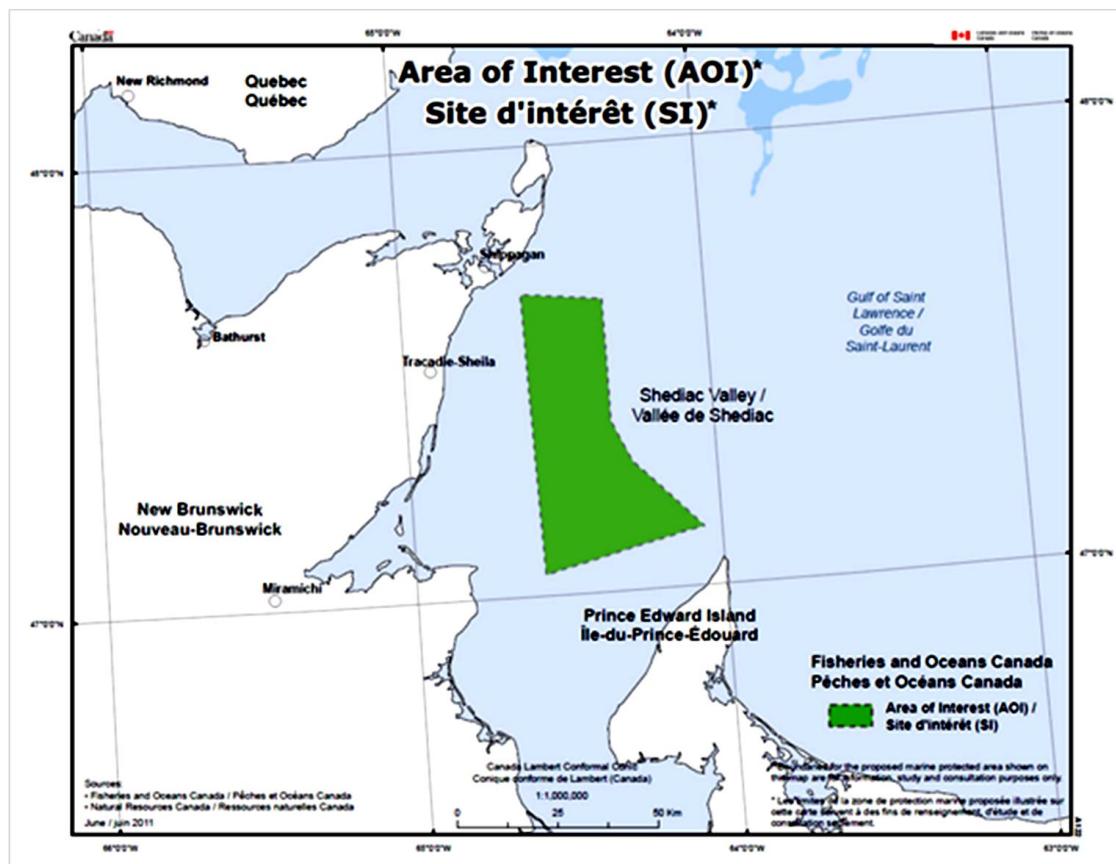


Figure 92. Shédiac Valley area of interest. Source: <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/shediacvalley-valleedeshediac/index-eng.htm>

St Anns Bank (Figure 93) has been designated AOI Interest for possible inclusion in a network of Marine Protected Areas under Canada's Oceans Act. St Anns Bank Area is a candidate Marine Protected Area (MPA), which would provide comprehensive and long-term management and protection for this area rich in biodiversity. St. Anns Bank was identified because it contains the

⁴⁴ <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/shediacvalley-valleedeshediac/index-eng.htm>

following ecological and biological features: a variety of habitat types, which range from the shallow waters of the Bank to the deeper waters of the Laurentian Channel; high diversity of fish species; important habitat for species at risk (e.g., Atlantic wolffish), depleted species (e.g., Atlantic cod), and several commercial species that are at low biomass levels (American plaice, white hake, redfish, witch flounder); sensitive ocean bottom habitats and species, such as corals and sponges; a summer foraging area for the endangered leatherback turtle; and a migration corridor for many fishes and marine mammals⁴⁵.

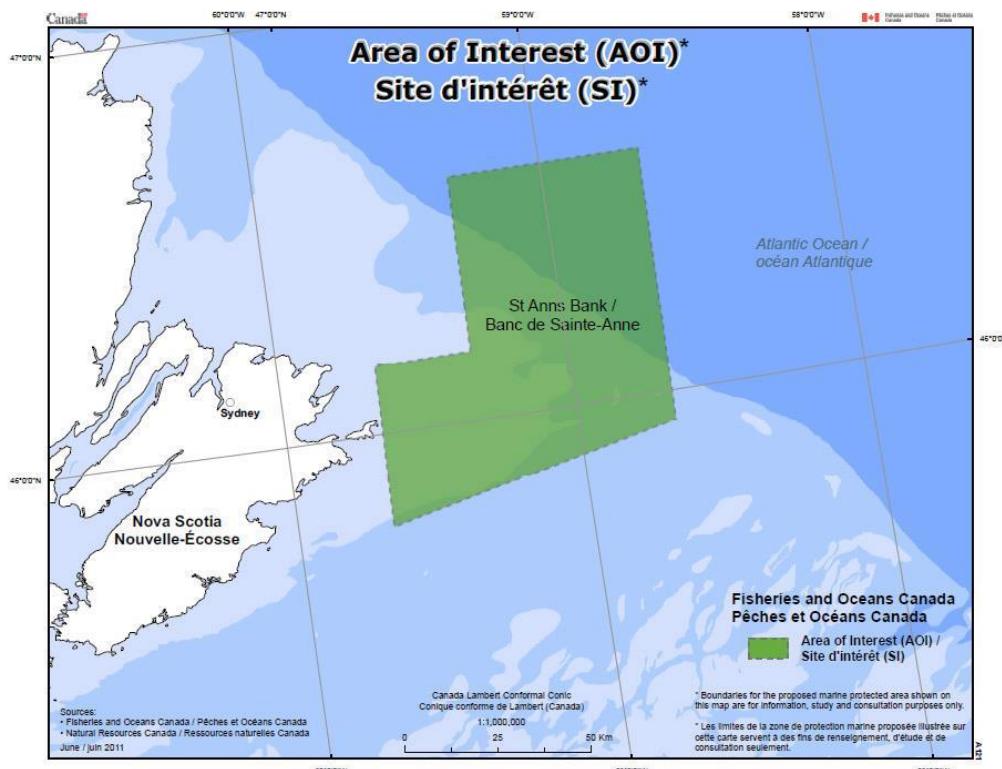


Figure 93. St. Ann's Bank AOI. Source: <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/stanns-sainteanne/index-eng.htm>.

Musquash Estuary MPA is located 20 km southwest of Saint John, New Brunswick. It is unique among Bay of Fundy estuaries because of its large size and relatively undisturbed condition. The estuary supports diverse habitat, an abundance of wildlife and commercial fisheries.

The MPA boundary is defined by the water level at low tide (Figure 94). Most of the intertidal area – the area exposed to air at low tide and underwater at high tide – is administered by DFO and is referred to as the Administered Intertidal Area. DFO works to conserve and protect the habitats and species that thrive in this ecosystem.

By regulations, lobster fishing is permitted in zones 2A, 2B and 3.

⁴⁵ <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/atlantic-atlantique/stanns-sainteanne/index-eng.htm>

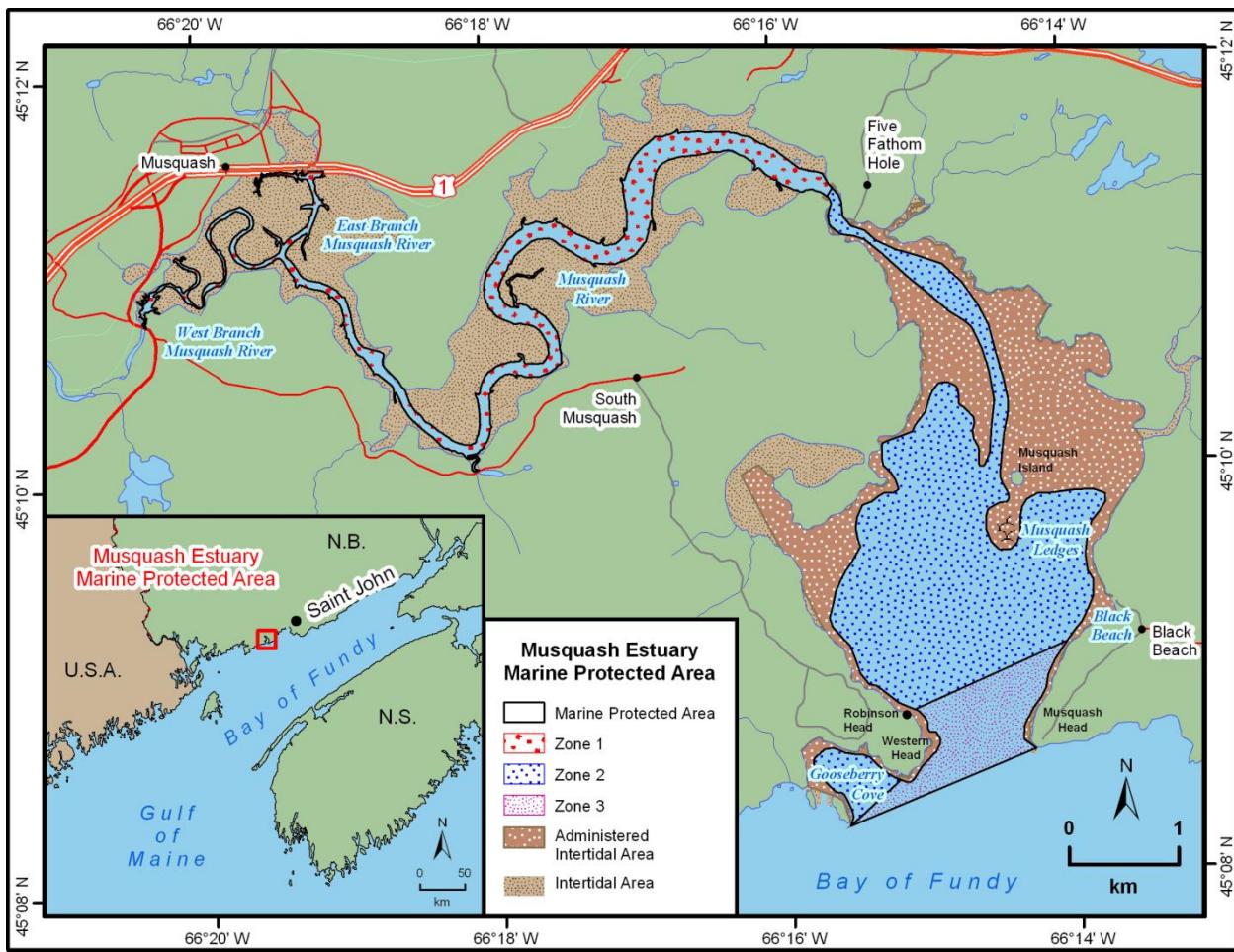


Figure 94. Musquash Estuary MPA. Source: <http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/OCMD/Musquash/Musquash-MPA>.

Fishing closure areas

Buffer zones were established to prohibit scallop dredging to protect lobster habitat (larval settling areas) in the Southern Gulf of St Lawrence. Scallop fishery exclusion areas are shown in Figure 95.

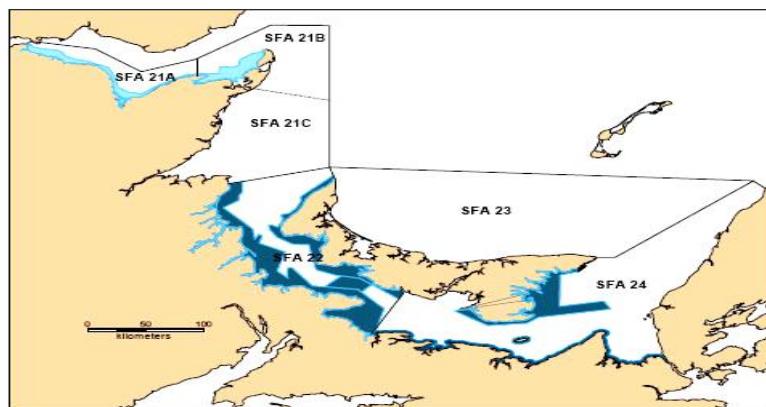


Figure 95. Scallop fishery exclusion areas. Source: <http://www.dfo-mpo.gc.ca/ea-ae/cat1/no1-5/no1-5-intro-eng.htm>

Spatial distribution of habitats in NB and NS

Dutil *et al* (2012) mapped the coastal and epipelagic habitats of the estuary and Gulf of St. Lawrence. The database presented describes the pelagic and benthic habitats of the 0 – 30 m surface layer in estuary and Gulf of St. Lawrence. The dataset includes 130 descriptors: cell location parameters such as cell address, latitude and longitude, and distance to the coast; landscape features such as depth, slope, insularity, coastline development, shore material and characteristics, degree of protection front the open sea, sensitivity of the shoreline to sea; hydrographic and oceanographic parameters such as distance to the nearest stream or river and its drainage area and mean annual flow, tidal range, vertical and horizontal currents, ice conditions, salinity and temperature at various depths. Coastal areas, particularly in the southern Gulf, appear to be more diversified locally than midshore and offshore habitats, which formed large patches of more uniform characteristics. The dataset provides useful information on the spatial extent of major coastal epipelagic habitats. 7 habitat categories were mapped from that dataset (Figure 96).

Figure 97 shows shoreline areas suitable for spawning and as nursery for larval and juvenile stages of various fish species (light blue patches). The superimposed deep blue patches indicate known occurrence of nearby eelgrass meadows. Eel grass meadows are considered “fish habitats”. According to the FPPS, the prohibition against *serious harm to fish* applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the *Fisheries Act* prohibits *serious harm to fish* which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”.

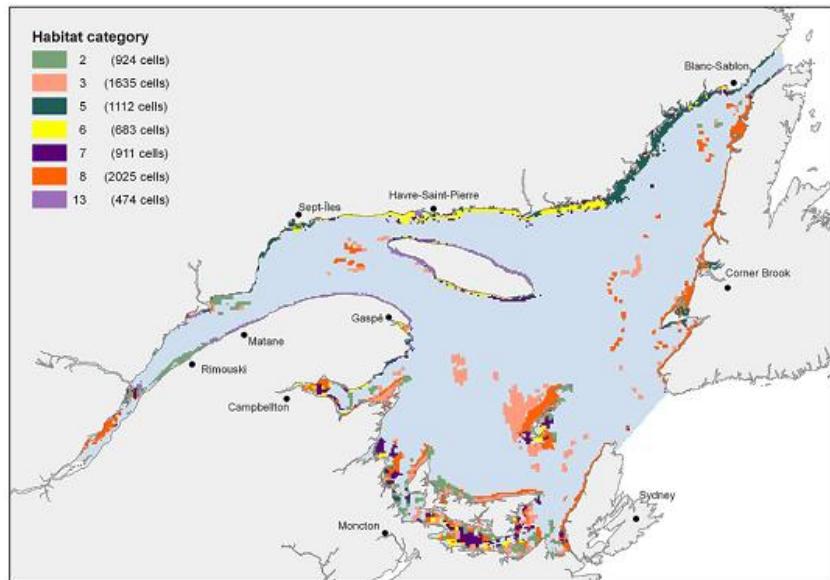


Figure 96. Spatial distribution of seven clusters of cells based on 103 habitat descriptors. Source: Dutil *et al* 2012.



Figure 97. Spatial distribution of sand beach, marsh, and mud flat (light blue areas). Within light blue areas, dark areas indicate cells located within 10 km of known eelgrass beds. Source: Dutil *et al* 2012.

Corals and sponges are defined as “fish” and “fish habitat” (Campbell and Simms 2009). According to the FPPS, the prohibition against *serious harm to fish* applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the *Fisheries Act* prohibits *serious harm to fish* which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. Concentration of corals and sponges on the east coast of Canada have been identified by Kenchington *et al* (2010) through spatial analysis of research vessel survey by-catch data following an approach used by the NAFO. As a result, inshore coastal areas of NB and NS are not considered as a significant area for corals and sponges (Figures 98 to 101).

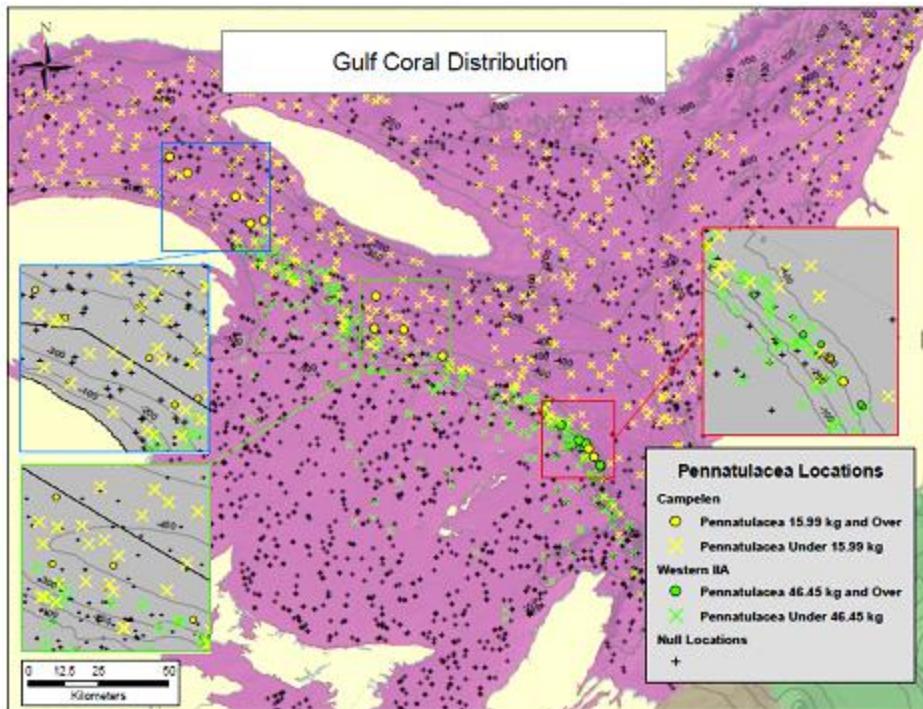


Figure 98. Location of significant Pennatulacea locations in the Gulf Biogeographic Zone. Source: Kenchington et al 2010.

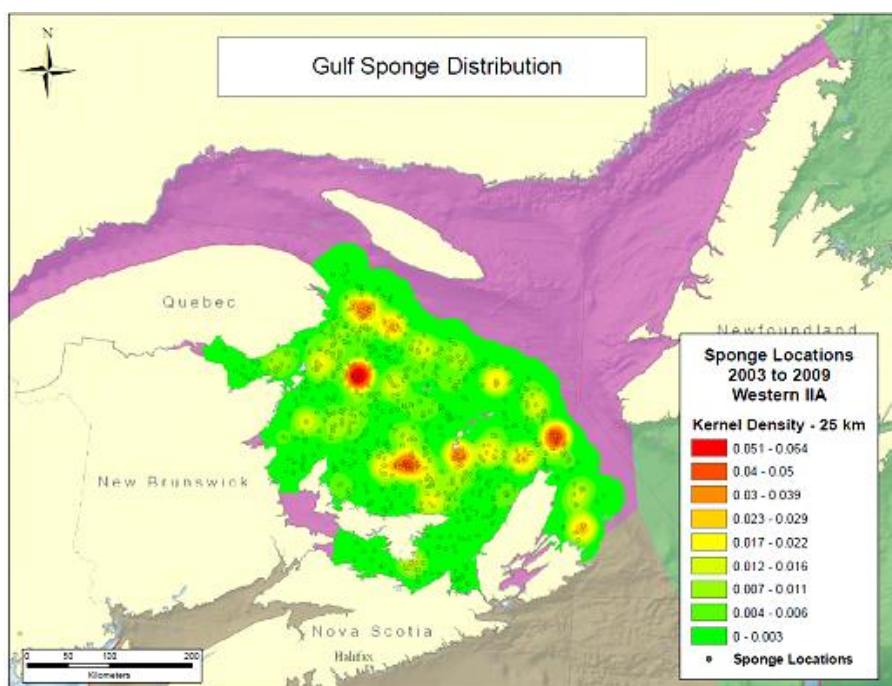


Figure 99. Interpolated density distribution (kg/km^2) of sponges in the SGSL. Data are from 2003-2009. Source: Kenchington et al 2010.

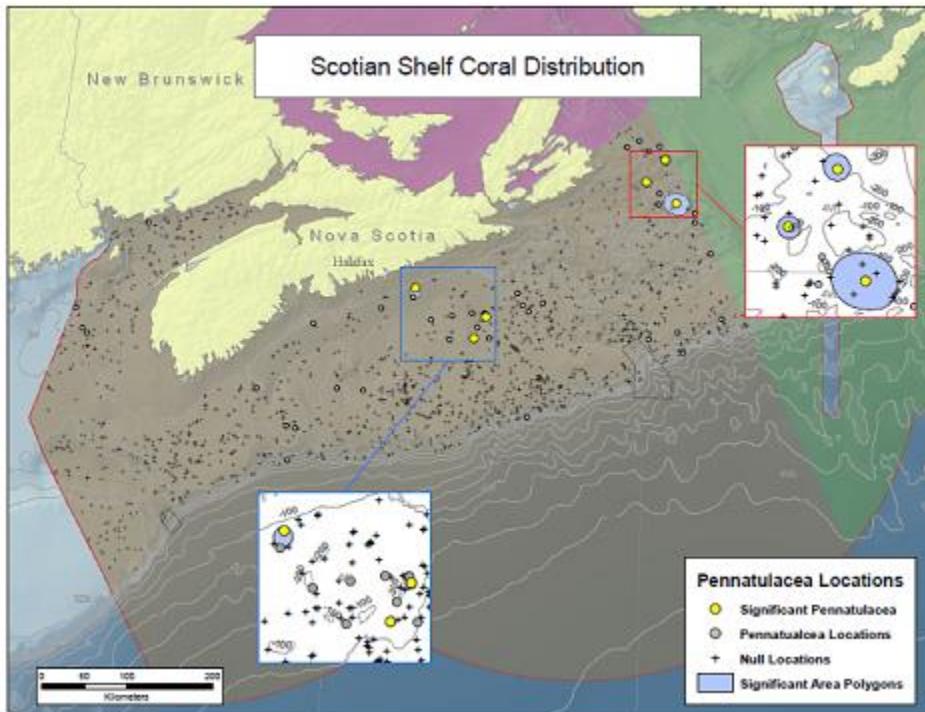


Figure 100. Locations of significant concentrations of sea pens on the Scotian Shelf as determined from spatial analyses of research vessel by-catch using Western IIA trawls. The Northeast Channel Coral Conservation Area and the Gully Marine Protected Area boundaries are indicated on the map. In all cases these records lie outside the protected area boundaries.

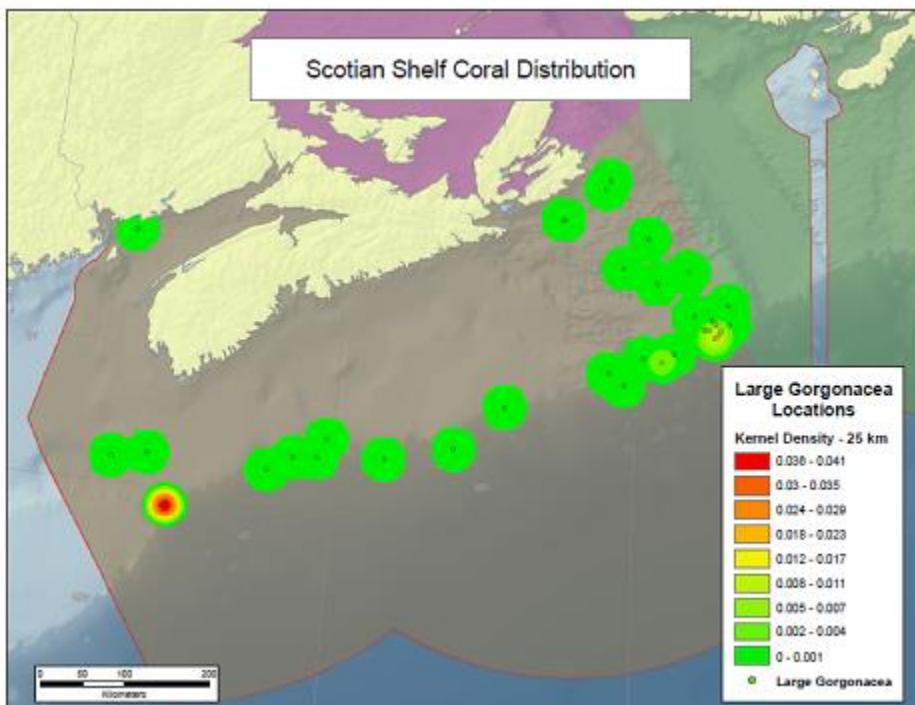


Figure 101. Interpolated density distribution (kg/km^2) of large gorgonians in the Scotian Shelf Biogeographic Zone sampled with a Western IIA trawl using a kernel density of 25 km and 9 density bins.

Impact of NS and NB lobster trap fishery on habitats

Traps are passive gear types that rely on bait to attract the target species. Although trap fisheries are generally considered to have slight impacts on the habitat, traps can impact biogenic structures (e.g. sponges, corals) through crushing or entanglement (DFO 2010). Crushing and scouring effects can result if traps are dragged across the bottom during retrieval or during periods of strong currents (e.g. storms, tides).

The potential impact of traps on marine habitats is dependent on a variety of factors including:

- Characteristics of the bottom where they are set (sediment type, relief and depth);
- Weight, size and construction material of traps;
- Retrieval methods and sea state, weather, tides, currents;
- Type of rope;
- Soak time;
- Use of anchor or weights; and
- String configuration (e.g. length) can affect degree of entanglement on bottom.

A study carried out by Chuenpagdee et al (2003) ranked fishing gears regarding their collateral impacts on bycatch and on habitats in U.S. each Fishery Management Council region. They found that traps have low and medium impacts on biological and physical component of habitat, respectively. Shester and Micheli (2011) quantify and compare the ecosystem impacts of four gears (lobster traps, fish traps, set gillnets, drift gillnets) used in small-scale fisheries of Baja California, Mexico, using at-sea observations and field experiments. Results indicated that traps caused minimal immediate damage to habitats. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor and a medium impact on corals and sponges. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage.

Figures 98 to 101 show that NB and NS are not considered as a significant area for corals and sponges. Moreover, DFO and lobster fishermen mentioned at site visit meetings that there is no overlapping between coral and sponge grounds and lobster fishing grounds.

In addition, the fishery footprint has been evaluated for LFA34 and LFAs 35-38 (DFO 2013d and DFO 2013E). LFA 34 encompasses approximately 20,000 km². The area affected by lobster traps ("fishery footprint") on an annual basis in LFA 34 was estimated using the number of trap hauls per season times the area of a typical lobster trap. This was then divided into the total area of LFA 34. The same calculation was done per each LFA 34 Grid Group. The trap size used was 21"x48" (American style trap), which does not account for movement of the traps. However, the analysis assumes that traps are dropped in a new location each time, which does not account for the expected overlap in trap footprints over time. The area affected by traps in any given year in LFA 34 as a whole is calculated to be less than 0.1% of the total area; in the nearshore Grid Groups, the total area affected is higher but still less than 0.2% of the total area. LFA 35-38 encompasses approximately 15,000 km². The area affected by lobster traps on an annual basis in LFAs 35-38 was estimated using the number of trap hauls per season times the area of a typical lobster trap. This was then divided into the total area of LFAs 35-38. The trap size used was 21"x48" which does not account for movement of the traps. However, the analysis assumes

that traps are dropped in a new location each time, which does not account for the expected overlap in trap footprints over time. The area affected by traps in any given year in LFAs 35-38 is calculated to be less than 0.05% of the total area.

There is a strategy in place to ensure that the NB and NS lobster fishery does not pose a risk of serious or irreversible harm to habitats. Impacts on habitats are limited by restricting the number and size of traps in use, the number of fishermen and the fishing season. Moreover, fishermen do not voluntary fish on Sundays. In addition, the strategy of fishing effort reduction adopted by DFO would reduce the impacts on habitats.

4.4.5. Ecosystem (for all UoCs)

Gulf of St. Lawrence Ecosystem

The Gulf of St. Lawrence is similar to an inland sea with a distinct ecosystem, characterized by partial isolation from the North Atlantic, freshwater runoff from the land, and a deep trough running along its depths, seasonal ice, the presence of a cold intermediate layer, shallow depths, and high biological productivity and diversity (DFO 2005b). The distinct qualities of physical and biological components of the Gulf combine to create its unique environment.

The Gulf of St. Lawrence is a semi-enclosed sea, covering an area of about $240 \times 10^3 \text{ km}^2$, that opened to the Atlantic Ocean through the Cabot Strait and the Strait of Belle Isle (Figure 98). The Laurentian Channel is a long, continuous trough over 300 m deep that runs 1,500 km from the continental shelf in the Atlantic Ocean to where it ends abruptly in the St. Lawrence Estuary at the mouth of Saguenay River near Quebec City. This trough brings deep oceanic waters to the estuary. There are secondary troughs and plateaus such as the Magdalen Shallows, which cover the southern part of the Gulf. The Gulf's submarine topography is considered complex, and strongly affects how water circulates, Circulation in the Gulf is generally counter-clockwise.



Figure 102. Physical environment of the Gulf of St. Lawrence. Source: DFO 2005b.

The physical environment and the chemical environment including suspended particulate matter, nutrients, oxygen, organic carbon and contaminants in the Gulf of St. Lawrence are studied and well known (DFO 2005b, Dufour and Ouellet 2007, Galbraith et al 2013).

The Gulf comprises a vibrant marine ecosystem with high biodiversity. The main groups and species found in the waters of the Gulf are: phytoplankton, zooplankton, invertebrates, forage fish, large ichthyophagous fish species, birds and marine mammals (DFO 2007c). At the base of any marine ecosystem, there is the phytoplankton. Benthic invertebrates feed on them when they fall to the bottom but zooplankton is almost its only predator. Zooplankton in turn is consumed by small forage fish species, e.g. capelin, sand lance, herring and mackerel. Forage species play a key role in transferring energy from secondary producers (zooplankton) towards fish and other higher trophic levels. Large ichthyophagous fish species include cod, redfish and flatfish. Overall, cetaceans, seals, cod ad redfish are the main predators of forage species. Marine birds also feed on them. The benthic community of invertebrates mostly made up of shellfish, molluscs, sea urchins and worms, ad includes species such as the northern shrimp, snow crab have an important role in the transfer of energy. Marine mammals form an unavoidable component in the trophic links in the Gulf. They are at the top of the food web.

A multidisciplinary and inter-regional program known as CDEENA (Comparative Dynamics of Exploited Ecosystems in the Northwest Atlantic) originally proposed a comparative analysis of changes in the structure and function of northwest Atlantic shelf ecosystems to determine how these may have affected the productivity of living resources⁴⁶. To this end, CDEENA brought together the expertise of

⁴⁶ <http://www.dfo-mpo.gc.ca/Library/279943.pdf>

field scientists and modellers to: (1) describe the changes in time and space, (2) identify and fill critical data gaps in the knowledge base, and (3) develop models to investigate ecosystem-level hypotheses (i.e., environmental variation, predation, fishing effects) concerning changes in reproduction, mortality, growth, and feeding of cod and other species. One of these ecosystems was the southern Gulf of St. Lawrence. Mass-balance models have been used to reconstruct trophic flows through the southern Gulf ecosystem before (mid-1980s) and after (mid-1990s) the collapse of the cod stock. The whole-system model of the southern Gulf is divided into 30 functional groups or compartments from phytoplankton and detritus to marine mammals and seabirds, including harvested species of pelagic, demersal, and benthic domains. Details of the input data (biomass, production, consumption, export, and diet composition) for each compartment used in the modelling have been published. The model provides a tool to evaluate the impact of human and environmental factors on the southern Gulf ecosystem.

Scotian Shelf and Bay of Fundy Ecosystem

The **Scotian Shelf** is part of a continental shelf that averages only 90 m depth and extends some 200 km in length. The shelf can be divided into an inner, middle, and outer shelf, each with its own characteristics (Worcester and Parker 2010). The inner portion of the shelf, from the Nova Scotia coast to about 25 km offshore is an extension of the coastal bedrock with generally rough topography. This area was scoured by glaciation, and, in southwestern Nova Scotia, there exists a wide flat portion of this inner shelf. The middle shelf has broad, deep basins in the central and western portions of the Scotian Shelf, while in the east; the middle shelf is an area of complex topography, with many small to medium-sized banks and small basins ("holes"). The outer shelf, the portion of the Scotian Shelf farthest from the coast, is a series of relatively broad, flat and shallow banks separated by gently sloping lower saddles. Sable Island is an exposed portion of Sable Island Bank and a unique feature of the outer shelf.

On the outer shelf, at about 200 m in depth (the "shelf break"), the ocean bottom begins to slope more steeply to a depth of about 2000 m (the continental slope). The series of submarine banks and cross-shelf channels along the outer shelf and basins and troughs along the central shelf serve to limit and guide near-bottom flow, resulting in a complex circulation pattern.

The **Bay of Fundy** is a narrow funnel-shaped body of water that lies between Nova Scotia and New Brunswick (Worcester and Parker 2010). It is 270 km long and 60 km wide at its widest point, and encompasses offshore oceanic features with shallow banks and deep channels, as well as diverse coastal marine habitats. It is underlain by the Fundian Lowlands formation of Triassic sedimentary rocks. The bottom contours largely follow the coastline and reflect its origin as a former drainage system originating in the Minas Basin-Truro area. It has some of the largest tides in world.

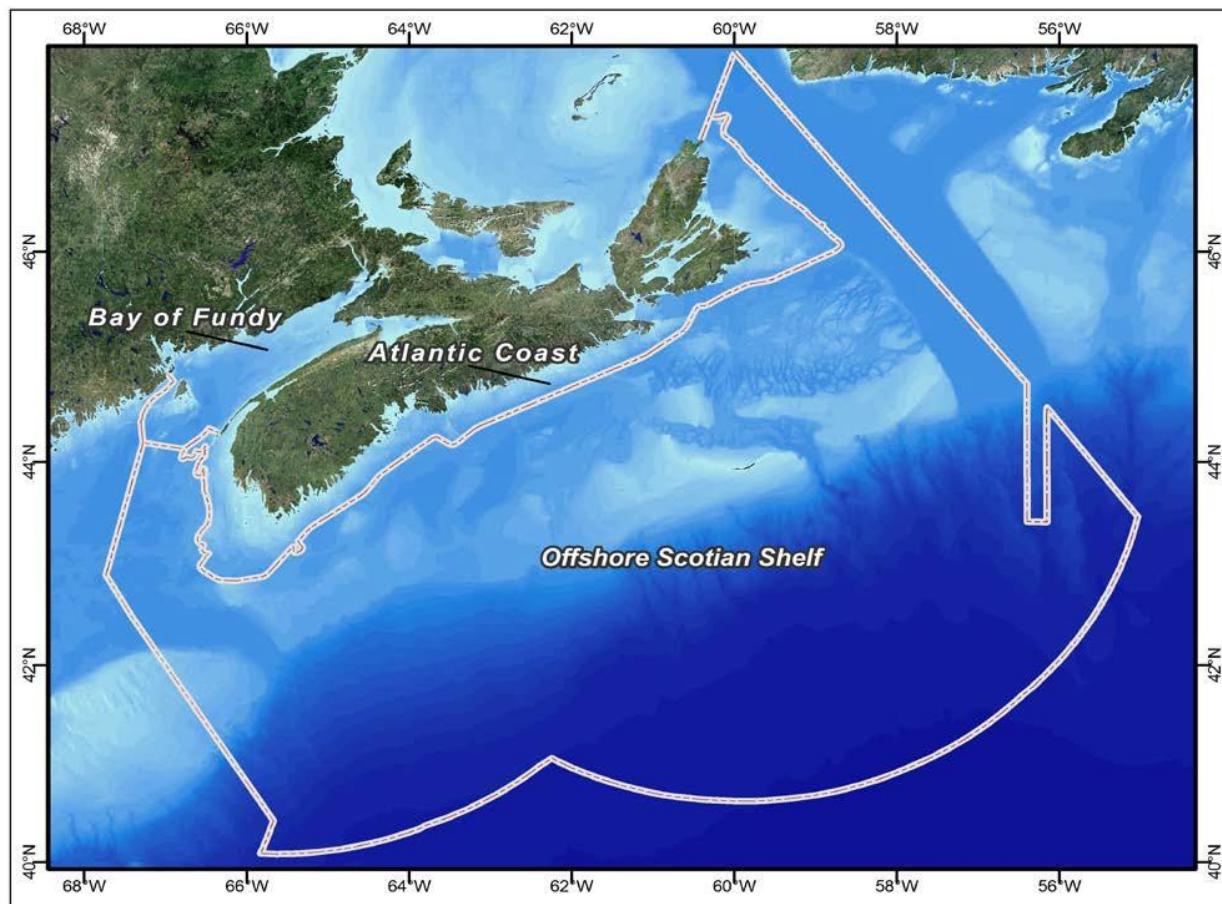


Figure 103. Map of Scotian Shelf-Bay of Fundy Bioregion. Source: DFO Maritimes region.

The physical environment and the chemical environment are studied and well known (Worcester and Parker 2010), as well as the biotic component.

Framework and Policies

Under the *Oceans Act* and the *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada*, DFO is committed to the development of large-scale and local integrated management plans for all of Canada's oceans. This includes implementation by DFO of an Ecosystem Approach to management 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)⁴⁷ which builds on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the

⁴⁷ <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)⁴⁸
- Managing Impacts of Fishing on Benthic Habitat, Communities and Species (April 2009)⁴⁹
- Policy on New Fisheries for Forage Species (April 2009)⁵⁰
- Ecological Risk Assessment Framework for Coldwater Corals and Sponges dominated communities (April 2013)⁵¹
- Policy on Managing Bycatch (April 2013)⁵²
- Guidance on Implementation of the Policy on Managing Bycatch (April 2013)⁵³

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 components⁵⁴. 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.

⁴⁸ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>

⁴⁹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthic-eng.htm>

⁵⁰ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/forage-eng.htm>

⁵¹ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-eng.htm>

⁵² <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-policy-prise-access-eng.htm>

⁵³ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-guide-prise-access-eng.htm>

⁵⁴ <http://www.dfo-mpo.gc.ca/science/publications/fiveyear-plan-quinquennal/index-eng.html>

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 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. The Ecosystem Research Initiatives focused on seven geographically-distinct areas including the the Gulf of Maine and Northumberland Strait (White et al 2013).

Because of the wide variety of human use and pressure, the Estuary and Gulf of St Lawrence and the Gulf of Maine were 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. In 2000, The Gulf of St. Lawrence Integrated Management (GOSLIM) project was thus created to develop and implement a management plan for ocean resources in the Gulf (Figure 104). The initial goal of GOSLIM was to describe the Gulf of St. Lawrence ecosystem and to identify activities and issues from a broad Gulf-wide perspective. Tools used to manage the Gulf of St. Lawrence include Ecosystem Overview Assessment Reports (Dufour and Ouellet 2007), identification of Ecologically and Biologically Significant Areas (EBSAs), seabed mapping, and development of ecosystem objectives (DFO 2005).

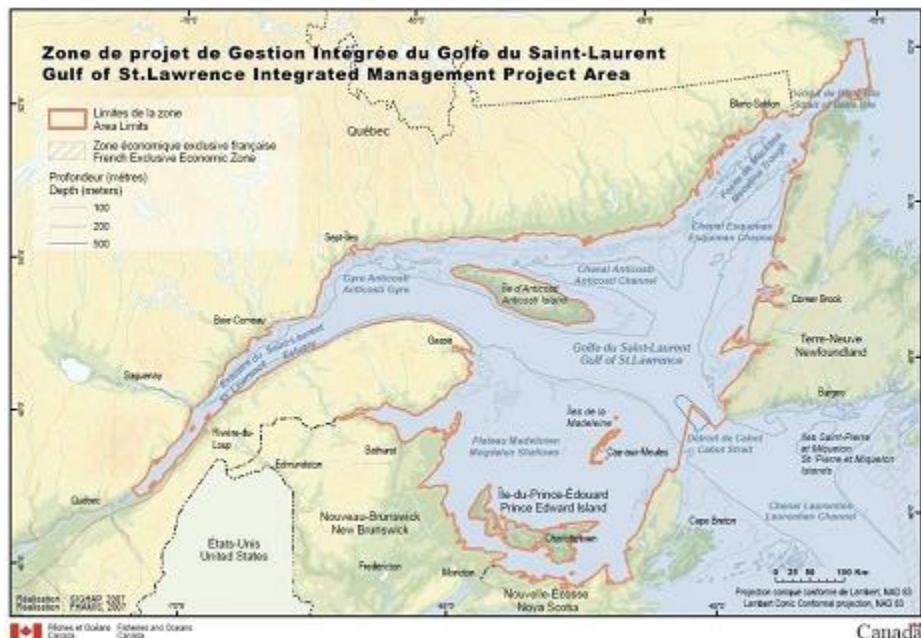


Figure 104. Map of the Gulf of St Lawrence illustrating the GOSLIM project. Source: Dufour and Ouellet 2007.

The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative (1998-2012) was a collaborative ocean planning process under the *Oceans Act* led and facilitated by the Oceans and Coastal Management Division (OCMD), Fisheries and Oceans Canada (DFO – Maritimes Region). ESSIM was a pilot initiative that developed an objectives-based approach to integrated, ecosystem-based ocean management, providing important lessons and multiple products (e.g., ecosystem overview and assessment report, ecologically and biologically significant areas, and a strategic management plan) to

advance the integrated oceans management program. DFO is currently moving beyond the Large Ocean Management Area (LOMA) concept pursued initially towards the Scotian Shelf-Bay of Fundy Bioregion (Figure 103). The bioregional focus will be on priority management needs and activities that are identified through ecosystem and risk management approaches, and addressed through effective management instruments and tools.

Identification of EBSAs represented a step towards specifying objectives for integrated oceans management and for the GOSLIM and ESSIM. It also helped identify research needs. The territories covered by the ESBAs play a remarkable ecological and biological role and therefore special treatment is required when managing activities that may affect them.

The Gulf of St. Lawrence has ten identified ESBAs, five of those areas fall within the boundaries of the SGSL (Figure 105).

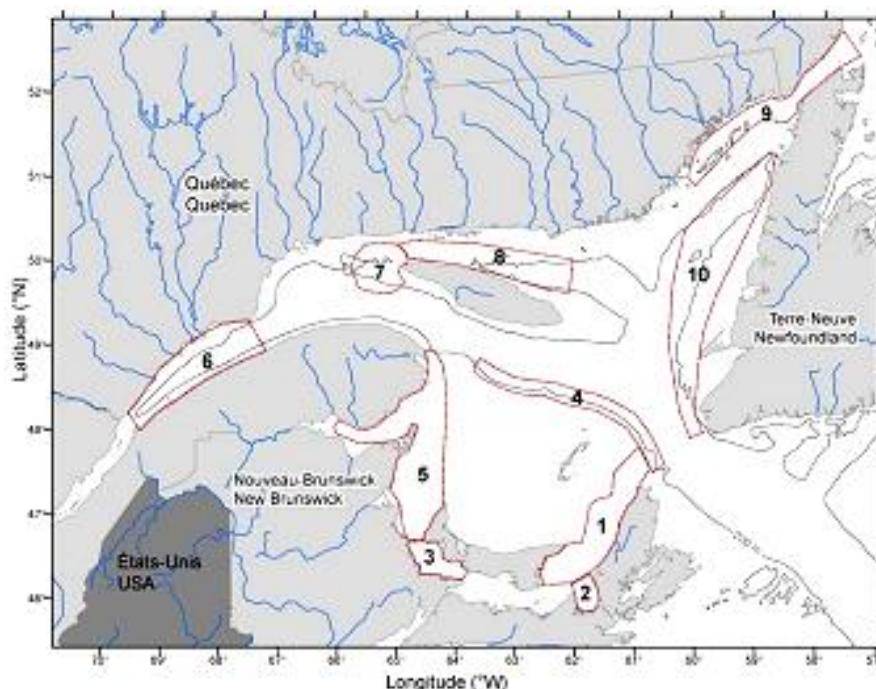


Figure 105. ESBA distribution in the estuary and Gulf of St. Lawrence.: (1) western Cape Breton, (2) St. George's Bay, (3) Northumberland Strait, (4) the southern fringe of the Laurentian Channel, (5) the southern-western coast of the Gulf, (6) the lower estuary, (7) western Anticosti Island, (8) northern Anticosti Island, (9) the Strait of Belle Isle, (10) the west coast of Newfoundland. Source: DFO 2007b.

The Bay of Fundy has 16 identified ESBA (Figure 106), and 20 ESBA has been identified for the Atlantic Coast of NS (Figure 107).

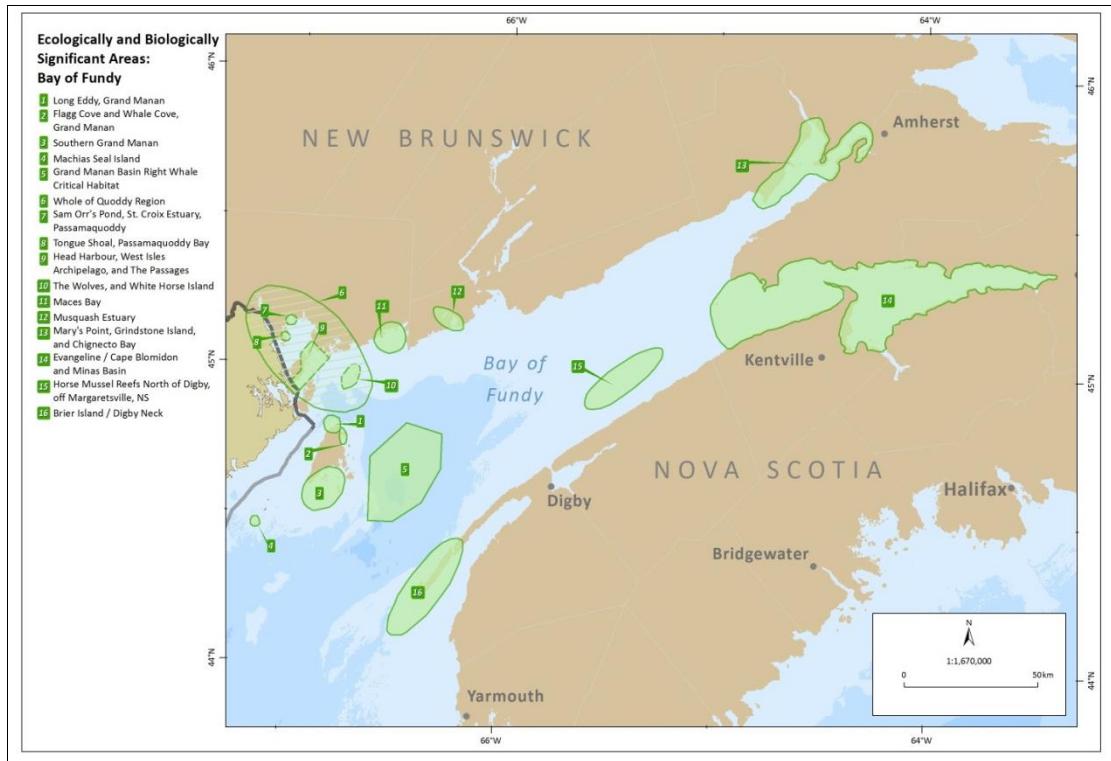


Figure 106. Location of ESBA identified in the Bay of Fundy. Source: DFO Maritimes Region.

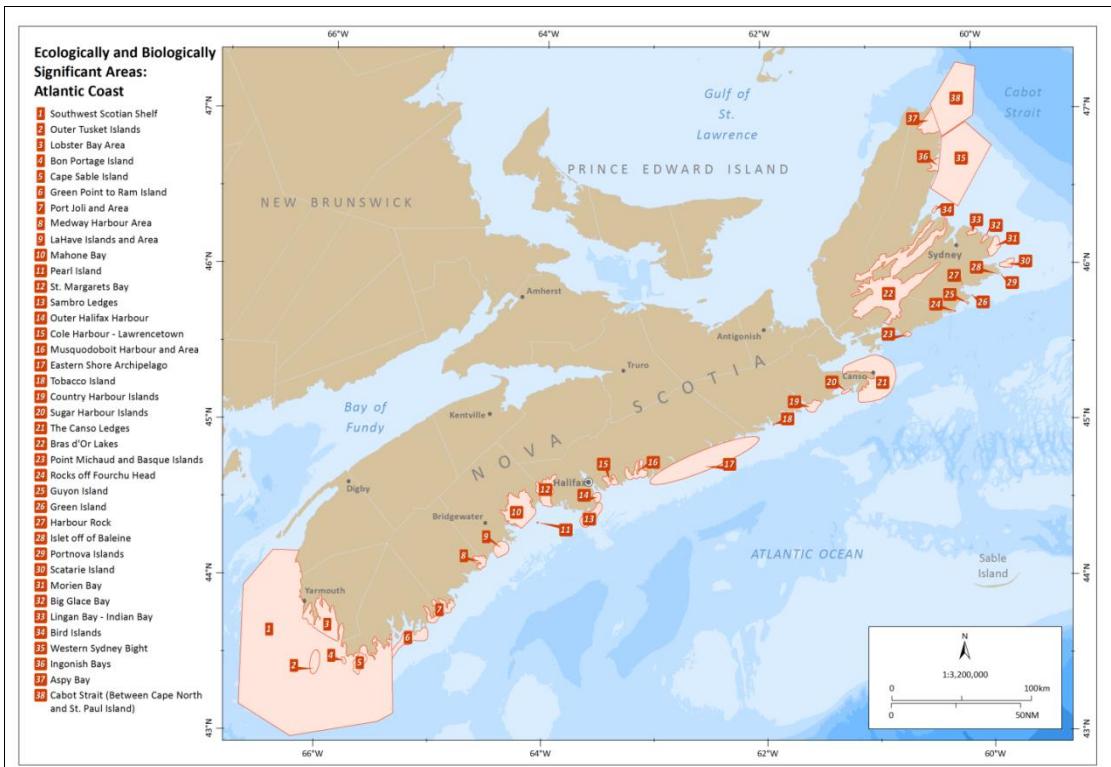


Figure 107. Location of the ESBA identified in the Atlantic coast of Nova Scotia. Source: DFO Maritimes Region.

A Five-Year Research Plan (2008-2013) has been developed by DFO⁵⁵. This plan provides a rationale for what research is conducted in support of priority areas, especially ecosystem-based management, and how this research will be delivered to ensure federal and departmental priorities are addressed while accounting for regional differences. The plan articulates how DFO Science will address research in support of priorities over the next five years, using the newly developed Ecosystem Research Initiatives, Climate Change Science Initiative and Centres of Expertise. The Research Plan will show how four of the priority areas will be addressed primarily through Ecosystem Research Initiatives (ERIs) that address regional research priorities including: Fish Population and Community Productivity, Habitat and Population Linkages, Climate Change / Variability, Ecosystem Assessment and Management Strategies. The remaining six priority areas will be addressed primarily by national Centres of Expertise (COEs) including: Aquatic Invasive Species, Aquatic Animal Health, Sustainability of Aquaculture, Ecosystem Effects of Energy Production, Operational Oceanography, and Emerging and Enabling Technologies for Regulatory and Policy Responsibilities.

Lobster in the SGSL food web

Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae)⁵⁶. Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Stomach analysis in Northumberland Strait showed that rock crab was the single most important component of the diet (between 45 and 68% of prey biomass) (Hanson 2009). Small sea stars and lobster represented between 0.7 and 12.9% of the prey biomass. Molluscs, polychaetes, and fish remains each did not exceed 7.5% of prey biomass. Predation on planktonic stages of lobster is rare and predation upon benthic stages of lobster is uncommon, principally restricted to finfish (sculpin and cod) and cannibalism (during the moult). DFO investigated lobster and predator-prey relationships using samples collected during trawl surveys in LFA 25 and part of LFA 26 (Comeau et al. 2008). Stomach analysis showed that decapods were the principal prey (57% to 84% of prey biomass), with rock crab being the single most important component of the diet (45% to 78%). Lobster represented 8% to 13% of the prey biomass. It has also been observed that the only demersal fish demonstrated to consume large amounts of lobster was the sculpin.

Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequence for lobster population dynamics and the productivity of lobster fisheries. At the contrary, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine (Boudreau and Worm 2010).

Impact of NB and NS lobster fishery on the Ecosystem

There is a large amount of literature that describing undesired effects of fishing on marine ecosystems. Fishing impacts include changes in size composition of target species, impacts on benthic communities, loss of diversity, disequilibrium of food web and impacts on habitats (Goñi 1998, Pauly et al 1998, Bianchi et al 2010).

The assessment team could not find any concern indicating that the NB and NS lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the

⁵⁵ <http://www.dfo-mpo.gc.ca/science/publications/fiveyear-plan-quinquennal/index-eng.html>

⁵⁶ <http://slgo.ca/en/lobster/context/foodchain.html>

fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the negligible impact on bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.

There is a strategy in place to ensure that the NB and NS lobster fishery does not pose a risk or irreversible harm to ecosystem structure and function by restricting the number of fishermen, the number and size of traps in use, and the fishing season. A MLS, the release of berried lobster female are required. Escape vents are required on traps and modified biodegradable panels is required, it reduces non-target species catch and impacts from lost traps (“ghost fishing”). Moreover, the Assessment team considered that the strategy of fishing effort reduction adopted by DFO through licence retirement (reducing the number of harvesters), reduction of the number of traps per licence and fishing only six days per week would have reduced impacts on ecosystem components.

4.5. Principle Three: Management System Background

4.5.1 The Legal Basis and Scope of the Management System

Federal Legislative Authority (For all UoCs)

The mature Canadian fisheries management system is based primarily on the extensive powers contained in the *Fisheries Act (1867)*⁵⁷ of Canada. The Act gives the Minister of Fisheries and Oceans broad discretionary powers including the absolute authority to enact regulations for the management of those subsistence, recreational and commercial fisheries which fall within the scope of section 91 of the *Constitution Act, 1982 (formerly the British North America Act, 1867)*. Various regulations pertaining to fish harvesting operations are made pursuant to the *Fisheries Act*; the principal ones for Atlantic fisheries include the *Fishery (General) Regulations (1993)*⁵⁸, the *Atlantic Fishery Regulations (1985)*⁵⁹, and the *Aboriginal Communal Fishing Licenses Regulations (1993)*⁶⁰. The *Coastal Fisheries Protection Act (1985)*⁶¹ (and the regulations made thereunder) which apply to the activities of foreign vessels operating within the Canadian EEZ is the other main source of the Minister's fisheries management powers. The Department of Fisheries and Ocean's primary legislation also includes the *Oceans Act (1996)*⁶², which, among other things, gives the Minister the authority to lead integrated oceans management and to implement the precautionary approach. The Department is also one of the three responsible federal authorities under the *Species at Risk Act (2002)*⁶³ which provides the legal framework for the protection of species that are determined to be endangered, threatened or of special concern. Canada's national network of marine protected areas is administered by Parks Canada

⁵⁷ http://www.sustainablefisheries.ca/download_files/LSP_Grafto_CH30.pdf

⁵⁸ <http://laws.justice.gc.ca/eng/regulations/SOR-93-53/>

⁵⁹ <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-21/>

⁶⁰ <http://laws-lois.justice.gc.ca/eng/regulations/sor-93-332/index.html>

⁶¹ <http://laws-lois.justice.gc.ca/eng/acts/C-33/index.html>

⁶² <http://laws-lois.justice.gc.ca/eng/acts/O-2-4/>

⁶³ <http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html>

pursuant to the *Canada National Marine Conservation Areas Act (2002)*⁶⁴.

The legal basis and scope of the management system for federally-managed fisheries in Canada is also influenced by a number of other legal instruments including the *Charter of Rights and Freedoms*, the *Financial Administration Act*, the *Canadian Environmental Assessment Act*, and statutes governing marine transportation. From time to time, legal rulings arising from Canada's judicial system will impact the use and scope of the Minister's authorities over such matters as fisheries access, enforcement and control, aboriginal and treaty rights, and trade.

Transport Canada administers a number of acts and regulations related to transportation, including marine transportation. Chief among its marine legislation is the *Canada Shipping Act (2001)*⁶⁵ whose key objectives are to protect the health and well-being of vessel crews, promote safety in marine transportation, protect the marine environment, and establish an effective inspection and enforcement program. Regulations of relevance to the fishing industry include *Small Fishing Vessel Inspection Regulations*, the *Marine Personnel Regulations*, and the *Collision Regulations*.

Domestic Management System (For all UoCs)

The fishery management system is further characterized by a comprehensive array of strategic national and regional policy frameworks and supporting instruments (including Integrated Fisheries Management Plans, Conservation Harvest Plans, Licence Conditions, Notices and Orders) which compliment the regulatory system and inform the operational requirements of the domestic management system for the fishery. Examples of broad-based DFO policy frameworks of application to all four lobster Units of Certification include: fisheries sustainability, protecting fragile marine areas and species, species-at-risk, ecosystem-based science, ecosystem approach to management, commercial licensing, implementation of the precautionary approach, bycatch management, and decision-making and stakeholder consultations.

More specifically, general licensing regulatory requirements are found in Part II of the *Atlantic Fishery Regulations (1985)* while regulations specific to the lobster fishery are outlined in Part VI. *The Fishery (General) Regulations* provide the basis for lobster licence conditions, and the authority to issue Variation Orders to set minimum legal carapace sizes and amend season dates from time to time.

Fisheries and Oceans is a duly constituted department of the Canadian Federal Government as set forth by the *Department of Fisheries and Oceans Act*.⁶⁶ Section 4 of the act stipulates that the powers, duties and functions of the Minister extend to and include all matters over which Parliament has jurisdiction, not by law assigned to any other department, board or agency of the Government of Canada, relating to

- sea coast and inland fisheries;
- fishing and recreational harbours;
- hydrography and marine sciences; and
- the coordination of the policies and programs of the Government of Canada respecting oceans.

⁶⁴ <http://laws-lois.justice.gc.ca/eng/acts/C-7.3/index.html>

⁶⁵ <http://laws-lois.justice.gc.ca/eng/acts/C-10.15/page-2.html>

⁶⁶ <http://laws-lois.justice.gc.ca/eng/acts/F-15/index.html>

Organizationally, the department's headquarters is located in Ottawa which is where the majority of its most senior executives are based. With few exceptions, the department's programs and services are structured within 'sectors' with accountabilities and authorities assigned accordingly. Many of the programs and services are decentralized where their impacts are most felt and are best evaluated. The organizational structure of the department is outlined at Figure 104. DFO reports that in 2011-12, more than eight of every ten employees worked outside national headquarters in one of its six regions. 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.

For the purpose of this fishery assessment, the lobster fisheries in Lobster Fishing Areas 23, 25 and 26 A&B (UoC 1) are managed by DFO's Gulf Region headquartered in Moncton, New Brunswick. This administrative region was created in 1982 and its geographical boundary includes all of the waters of the Gulf adjacent to the eastern coast of New Brunswick, the Northumberland Strait coastline of Nova Scotia and western Cape Breton, as well as the whole of Prince Edward Island. The lobster fisheries in Lobster Fishing Areas 27 to 33 (UoC 2), 34 (UoC 3), and 35 to 38 (UoC 4) are managed by DFO's Maritimes Region which is headquartered in Dartmouth, Nova Scotia. The region's administrative boundary extends from the tip of Cape Breton Island, along the province's eastern and western coastline, and to both sides of the Bay of Fundy.

Aboriginal Fishing (For all UoCs)

The Aboriginal and treaty rights of the Aboriginal Peoples of Canada 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 that the Musqueam First Nation has an Aboriginal right to fish for food, social and ceremonial purposes. The Supreme Court found that where an Aboriginal group has a right to fish for food, social and ceremonial purposes, it 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 potentially 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 has negotiated fishing agreements and undertaken a variety of initiatives to support the participation of these First Nations in commercial fisheries.

DFO developed and implemented a national Aboriginal Fisheries Strategy⁶⁷ as a framework to manage the fisheries in a manner consistent with the *Sparrow* decision. The objectives of the strategy include:

- provide a framework for the management of fishing by Aboriginal groups for food, social and ceremonial purposes.

⁶⁷ <http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm>

- 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*.⁶⁸ Aboriginal participation in the commercial fishery is communal in nature meaning that licences are issued to a First Nation who then designates the persons and vessels that are 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.

International Management System (not relevant to the 4 Units of Certification)

Canada is a signatory to the United Nations Convention on the 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 landings⁶⁹ 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).

Canada-United States Transboundary Fishery – Bay of Fundy (Unit of Certification 4)⁷⁰

In October 1984, a binding decision by the International Court of Justice (ICJ) decision established the official boundary between Canada and the United States (US) in the Gulf of Maine known as the "Hague Line". The ICJ decision did not address overlapping claims within the 12 mile limit. As a result, an area of approximately 259 km² surrounding Machias/Seal Island, commonly referred to by

⁶⁸ <http://laws-lois.justice.gc.ca/eng/regulations/sor-93-332/index.html>

⁶⁹ http://www.dfo-mpo.gc.ca/international/media/bk_fao-eng.htm

⁷⁰ As reported in DFO Maritimes' IFMP (2011) for the lobster fishery

industry as the “Grey Zone” remains in dispute. The authority for the Canadian claim is found in the *Oceans Act*, Fishing Zones of Canada (Zone 4 and 5) Order. The authority for the US claim is taken from the US Federal Register/Vol. 60: No 163/ Wednesday August 23, 1995 / Notices 43825.

In the late 1990’s Maine lobster harvesters significantly increased their effort in the “Grey Zone”, causing considerable concern for adjacent Canadian lobster harvesters. Discussions between officials and licence holders had failed to achieve a consensus on the management of this area. The Conservation and Protection Program became involved when there were contraventions against the *Fisheries Act* and Regulations. Enforcement officials liaised with counterparts from NOAA (US Fisheries Enforcement Agency) and annual meetings were held to discuss what could be done by both countries to resolve/mitigate the disputes amongst harvesters. Most of the resulting effort has been a show of enforcement presence and fostering discussion between both countries. Since 2002, DFO has authorized LFA 38 licence holders to fish from August 15 to October 31 providing year-round Canadian fishing access within the “Grey Zone” (LFA 38B)⁷¹.

Canada-US enforcement collaboration has included an annual joint enforcement planning meeting between Department of Marine Resources (DMR), National Oceanic and Atmospheric Administration (NOAA) and DFO. In addition, DFO Conservation and Protection officials, the Canadian Coast Guard Captains and the State of Maine Department of Marine Resources have a joint planning approach for vessel patrols providing a strong “flag state” enforcement presence throughout the “Grey Zone”. There was also agreement to use the *Lacey Act* to help support each country’s enforcement actions.

The situation today has much improved from the earlier skirmishes. Canadian harvesters fish in accordance with DFO’s specific Conservation Harvesting Plan for 38B and their US counterparts do the same in regard to the US management plan for the disputed area. DFO Maritimes reported⁷² that in today’s context, if sporadic conflicts on the water were to occur in the Grey Zone, operational resources would be deployed commensurate with the gravity of the situation, including consultation and cooperation of the various agencies relevant to the circumstances.

If a situation was to escalate, DFO reported that its’ enforcement officers would intervene to resolve disputes domestically, and in partnership with international enforcement agencies when appropriate. Additionally, the Grey Zone Committee of the Canada/US Transboundary Resources Steering Committee could be used as a mechanism to resolve conflicts. This committee was formed as a result of the cooperative working relationship DFO built with both US enforcement and fisheries management groups at state and federal levels. In the past, DFO worked together with its US counterparts through this committee to facilitate a meeting between fishers to help them resolve issues at their level.

Dispute Resolution Mechanisms (For all UoCs)

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 dealt with an aboriginal right, the second with a treaty right, and the third found that the Minister did not have the legal authority to allocate fish to industry stakeholders in exchange for their contribution to research

⁷¹ The LFA 38B lobster fishery is closed for a three-day period preceding the opening of the LFA 38 fishery on the second Tuesday in November.

⁷² Per.comm, May 30, 2014.

costs and science data. However, the *Fisheries Act* was recently amended to grant this authority⁷³. The Minister's power to allocate for reasons other than conservation (such as for social or economic purposes) was also confirmed in another earlier court challenge.

Apart from the legal system, 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.

DFO regularly obtains legal advice from Department of Justice lawyers assigned to DFO prior to providing recommendations to the Minister on such undertakings as new policy initiatives, changes to management strategies, regulatory amendments, and new licence conditions for the fishery. Legal advice may reflect any number of elements of constitutional, administrative, aboriginal, fisheries and criminal law. This advice is sought to verify that DFO is acting within its legal authority, and as a consequence, the risk of legal disputes may be mitigated.

Moreover, DFO takes proactive measures to engage all key stakeholders on a timely basis in discussions related to, *inter alia*, proposed changes to legislation and fisheries management measures through such fora as the Southern Gulf of St. Lawrence Lobster Advisory Committee and the Maritimes Region Lobster Advisory Committee. This is to ensure that proposed changes are understood by stakeholders and that the information, experiences and perspectives of stakeholders are considered. As it provides an opportunity to discuss concerns, it may also assist in resolving differences without the need for court proceedings.

There is no evidence to indicate that the fishing industry does not comply or would not comply with judicial decisions. Lastly, quite apart from the established advisory committee processes, a number of other engagement fora frequently involve DFO when significant strategic policy, regulatory and program changes are proposed and where industry and /or other stakeholders groups can contribute their views. Examples include parliamentary committee hearings, independent panels, inter-governmental roundtables, commissions of inquiry, and judicial reviews of ministerial decisions – all of which can lessen the likelihood of legal challenges.

⁷³ The *Fisheries Act* was subsequently amended in 2013 to grant the Minister of Fisheries and Oceans the authority to allocate fishery resources to parties under formal agreements for the purpose of undertaking specific activities in support of fisheries management and research.

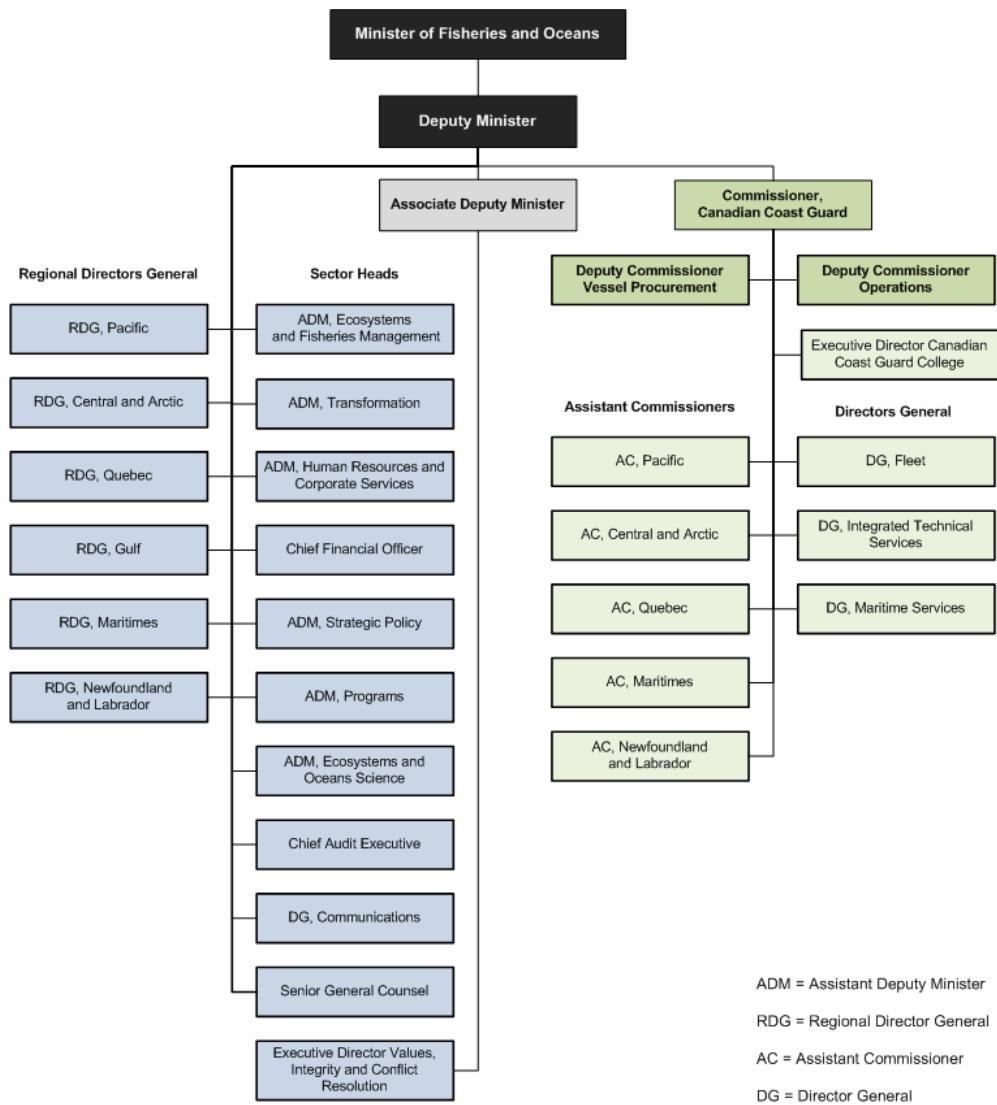


Figure 108. Organizational Chart of the Department of Fisheries and Oceans.

4.5.2 Consultation Processes

DFO regularly undertakes both formal and informal consultations with fishing industry stakeholders and other groups in the exercise of its mandate and delivery of its programs and services. The formal consultative process is overseen by a departmental framework first published in 2004⁷⁴ and which consists of 3 broad themes, 9 principles and 37 guidelines, all of which are in support of building a common understanding and coordinated approach to consultation and the decision-making process. A consultation toolbox was developed to guide staff in planning and evaluating consultation processes⁷⁵. A second, parallel framework, approved for use by the Treasury Board Secretariat in 2011, addresses

⁷⁴ <http://www.dfo-mpo.gc.ca/Library/282187.pdf>

⁷⁵ <http://www.dfo-mpo.gc.ca/Library/282189.pdf>

how the federal government can meet its specific legal duty to consult and accommodate aboriginal peoples when their aboriginal and treaty rights may be impacted.

Regional Processes: Management and Science

DFO's Gulf and Maritimes Regions' approach to formal industry engagement on fisheries management issues is centered on advisory committees consisting of representatives of various accredited inshore fish harvester associations, aboriginal groups, processors, and provincial government representatives. Other federal department representatives may be invited to participate when other industry-impacting issues arise.

(a) Regional Management: LFAs 23, 25 and 26 A&B – Unit of Certification 1

The regional mechanism relative to the commercial lobster fishery in LFAs 23, 24, 25 and 26A&B is the Southern Gulf of St. Lawrence Lobster Advisory Committee. Prior to 2009, the committee met annually usually over the winter period; since then, committee meetings have been scheduled approximately every 2-3 years at the call of DFO (February 2009, December 2011, December 2013). The revised meeting timeframe reflects the department's move to multi-year fishery management planning, and formal lobster stock assessments for each LFA of approximately every five years including a formal government-industry science peer-review process, known as the Regional Assessment Process (RAP).

The Committee's Terms of Reference as examined by the assessment team incorporate its role and scope, chairmanship, proceedings and meeting frequencies, administration and membership. Of note, the committee is not a decision-making body per se but makes recommendations for ministerial consideration; the committee is convened following the release of the scientific assessment of the fishery or when new policy or management measures are contemplated; sub-committees or working groups may be established to examine and evaluate initiatives or management measures relevant to the southern Gulf in advance of a meeting of the regional committee; outcomes are not voted upon by the membership, rather consensus is preferred. A provisional agenda is circulated approximately 2-3 weeks prior to the meeting of the committee which affords the participating fish harvester organizations the opportunity to prepare their positions, and seek agenda additions.

(b) Local Management: LFAs 23, 25 and 26A&B – Unit of Certification 1

Each LFA of the Southern Gulf of St. Lawrence has its own local lobster advisory committee which consists of representation of DFO, fish harvesters, aboriginal communities and provincial government staff (as necessary). These committees have formal terms of reference and members meet annually to discuss issues specific to their LFA. Subjects may include fishery openings, management measures, licensing administrative rules, research projects, and enforcement. Where consensus is achieved for changes to the management of the fishery at the LFA level without implications for adjacent LFAs, they are generally decided by the Regional Director-General. All other matters (those having inter-LFA or inter-provincial implications) are decided at the national level and frequently by the Minister.

The governance system and administrative rules by which the various harvester organizations operate are outlined in their respective bylaws, including how motions are tabled, debated and decided. Issues that are deemed to be significant in regard to their scope and potential implications are regularly put before the members who have the opportunity to register their opinions through a vote process. This

process serves to inform the organizations' representatives thus ensuring that members' views and recommendations are presented at committee meetings.

Information provided to the assessment team by DFO and stakeholders indicates that participants in both fora have a good understanding of their roles and responsibilities, committee procedures, and the decision-making process. The vast majority of representatives have been involved in the consultation processes for many years, and, as a result, contribute to a respectful and effective work environment.

Of note, however, during the site visit, some stakeholders informed the assessment team that the concept of consensus lacked clarity and transparency within DFO. They noted that while their organizations were accredited under provincial legislation as the official representative of lobster fishers in a specific LFA and that DFO has traditionally recognized their accreditation certificates, DFO did not have a clear rule in place when deciding whether to accept or reject a recommendation from their organizations. They asked: what constitutes consensus and how is it supposed to be demonstrated?

(c) Regional Management: LFAs 27 to 33, 34, and 35 to 38 – Units of Certification 2, 3 and 4

The DFO Maritimes' Regional Lobster Advisory Committee (MRLAC) meets on an annual basis. During the past three years the committee has met on September 27, 2011, September 12, 2012, and October 11, 2013. The assessment team was provided with a copy of the committee's draft Terms of Reference (prepared in 2006); agendas for these meetings were considered. There is no intent to review the TOR at this time. Minutes for the 2011 and 2012 meeting were not available. Minutes for the 2013 meeting are in draft form to be approved at the next meeting of the committee in 2014. Of note, DFO is required to protect the release of personal information as per the federal *Privacy Act* and third party information as per the *Access to Information Act*. Accordingly, information of this type is exempted from committee meeting minutes.

The MRLAC is tasked with providing input and advice to DFO on the conservation, protection, scientific research and proper management of the lobster resource. It serves as the pre-eminent consultative forum for the development of management measures across LFAs. The Committee can:

- review recommendations made by individual LFA advisory committees to determine what management measures could/should be included in the regional Integrated Fisheries Management Plan (IFMP), including annual Conservation Harvesting Plans (CHP);
- give consideration to scientific, biological, marketing, economic and/or other information as it potentially affects the proper management and long term sustainability of the lobster resource; and
- establish sub-committees at its discretion.

The Committee is comprised of representation from each LFA and will reflect Aboriginal and non-Aboriginal harvesters, buyers, processors, provincial governments, fishery unions/associations. Other community stakeholders and non-governmental organizations may participate in meetings at the discretion of the Committee.

The Committee operates on a consensus basis (no voting). All members present will be polled for their position on any item when a consensus is not achieved, and the results submitted to

appropriate DFO senior management for decision. All Committee meetings are open to observers, including the media unless otherwise specified. Any representation(s) from observers to the Committee shall be at the invitation of the Chair and/or Co-Chair only.

(d) Regional Inter-Sectoral: LFAs 27 to 33, 34, and 35 to 38 – Units of Certification 2, 3 and 4

The DFO Scotia-Fundy Industry Roundtable meets on a semi-annual basis. The past three meetings of the Roundtable occurred on December 4, 2012, April 25, 2013, and September 20, 2013. The Roundtable's Terms of Reference and agendas for these meetings were provided to and considered by the assessment team. The approved meeting minutes were also made available to the assessment team. Personal and third party information is also protected by the Department.

The Roundtable's mandate consists of developing perspectives on, *inter alia*, broad conservation issues affecting habitat protection, protection of biodiversity, ecosystems; addressing conflicts related to oceans use; addressing multi-fleet and multi-sector issues; and contributing to a greater understanding of complex ocean and fishery interactions. Membership includes DFO representatives from various sectors, industry harvester and onshore processing sectors, aboriginal communities, and provincial governments. Others members may be added as required, and meetings are open to the public. The committee meets at least twice annually. Sub-committees and standing committees may be established to work on specific issues; workshops may also be organized to gain further insights on specific policy or operational matters or to solicited stakeholders' views. Advice generated by the roundtable can be communicated to any number of existing DFO-Industry committees or to other federal-provincial bodies for further consideration and follow-up.

(e) Local Management: LFAs 27 to 33 and 35 to 38 – Units of Certification 2 and 4

The assessment team was informed by DFO and stakeholders that, with the exception of LFA 38, all LFAs have functioning local lobster advisory committees that meet at least annually and more frequently as necessary. In LFA 38, DFO meets with the Grand Manan Fishermen's Association's Lobster Management Board; however, according to a document provided to the assessment team dated December 17, 2013, DFO intends to establish a formal area lobster advisory committee in 2014. With the exception of LFA 36, all other committees operate under formal Terms of Reference; however, the team noted that some committees have been operating under Terms of Reference that had not been reviewed or updated for several years. The assessment team examined three specific committee Terms of Reference (LFA 31a, 31b, 33) and found the information to be reasonably comprehensive and well-defined.

Several committees operate with DFO and Industry co-chairs. Participants generally include representatives of fish harvesters and organizational staff, various DFO sector representatives, aboriginal communities and the provincial Department of Fisheries and Aquaculture. As in the Gulf Region, the local advisory committee members typically deal with issues and concerns that pertain to their LFA and for which local DFO staff are fully acquainted. With one exception, stakeholders expressed satisfaction with the support provided by DFO and felt that their fisheries management requests were carefully considered and endorsed for the most part. Stakeholders from LFA 38 expressed concerns that local DFO personnel were hand-tied by departmental practices and were prevented from making decisions on purely local fisheries management issues that were roundly

supported by industry.

(f) Local Management: LFA 34 – Unit of Certification 3

The Lobster Fishing Area 34 Advisory Committee provides input and advice and makes recommendations to DFO in regards to the conservation, protection, scientific research and management of the lobster resource. The Committee serves as the pre-eminent consultative forum for the development of management measures for the fishery and its Terms of Reference are reviewed annually by the committee.

The Committee is comprised of representatives of various DFO sectoral programs, 16 Port Cluster representatives (all lobster licence holders), 3 representatives of aboriginal organizations, processing facilities, and a representative of the provincial government. The Committee is empowered to add representatives of community stakeholders and non-governmental organizations at its discretion.

Meetings of the committee are co-chaired by DFO and the Industry with the former providing administrative support for the committee's business. The Committee may establish sub-committees at its discretion to examine specific issues as directed by the Committee. Sub-committee membership may include non-members of the Committee if warranted and agreed to by the Committee. The Committee's meetings are open to observers, including the media, unless otherwise specified.

The Committee must meet at least once annually and may meet more often at the discretion of either co-Chair. Special committee meetings can be arranged if requested by at least 5 voting members of the committee. Meeting agenda items may be submitted by any committee member; a final agenda is communicated to the committee at least 3 weeks prior to the meeting date which allows the port cluster representatives to hold a mandatory meeting of the licence holders from their respective port clusters.

Voting members are the 16 port cluster representatives and the 3 Aboriginal representatives. The Committee seeks to operate on a consensus basis. When consensus cannot be achieved, the voting members are polled and each voting member's position recorded. For decision-making purposes, a strong consensus will constitute support from 66% of the voting representatives (12 of 19 representatives). Additionally, the committee can proceed with a mail-in ballot of all LFA 34 fishers if supported by 66% of the voting members.

The interests of lobster fishers are further served by the LFA 34 Lobster Management Board, an industry association comprised of harvester-representatives from all of the port clusters in the LFA and the Acadia First Nation. The Board works on behalf of harvesters on a variety of lobster fishery issues and projects.

(g) Science – All 4 Units of Certification

While DFO Science representatives participate in all Southern Gulf and Maritimes regional management committee meetings and most local LFA committee meetings when availability permits, the aforementioned RAP process is a separate entity, and is subject to different administrative, policy and procedural rules. These rules are laid out on the Canadian Science Advisory Secretariat's website⁷⁶. As

⁷⁶ <http://www.dfo-mpo.gc.ca/csas-sccs/process-processus/process-processus-eng.htm>

noted, the goal of DFO's science peer review and advisory processes is to provide high quality scientific advice and information through rigorous peer review with the overall objective of providing the best possible science advice to the Minister, managers, stakeholders and the public. All participants attending a CSAS science peer-review and advisory meeting are encouraged to question, comment and constructively challenge the science presented; as well as seeking consensus on conclusions during the meeting. Peer review meetings are intended to be a forum for review and challenge of scientific information leading to objective consensus. Science peer review processes are evidence-based, objective, impartial and respectful. DFO strongly encourages that participants be chosen for their knowledge of the topic(s) (e.g., species, modeling) under review, their understanding of the nature of peer review, their role as contributors of knowledge and perspective, and in controlling the quality of information and advice resulting from the meeting through constructive criticism and consensus decision-making. All participants at science peer review meetings are expected to participate as objective and knowledgeable individuals on the subject matter under review, and not as advocates or representatives of any interest group. Attendance at CSAS meetings is not intended to provide participants with information or "early" advice on an issue prior to the approval and release of the scientific advice. Participation at DFO science peer-review meetings is by invitation only.

The reporting of the outcomes of the discussions from the management and sciences fora differs. For the science-based RAP process, the Science Advisory Reports, Research Documents, and Proceedings are recorded and published in both official languages on the CSAS website. By contrast, meeting minutes from the regional and local lobster advisory committees are not posted on the DFO website but are distributed to participants by email. The processes also differ in how they deal with attendance by non-core participants and the general public. In the case of the regional and local lobster advisory committees, the public may attend however media representatives are not permitted to record, video or photograph the proceedings. RAP meetings are not open to the general public.

(h) Canada – Nova Scotia – Mi'kmaq Consultation Frameworks: Units of Certification 2, 3 and 4

In Nova Scotia, the federal and provincial governments and the leadership of the 13 Mi'kmaq First Nations entered into important agreements that define and guide how the parties will negotiate and conduct consultations on a wide range of issues.

In 2007, the parties concluded a framework agreement, known as the Mi'kmaq - Nova Scotia - Canada Framework Agreement⁷⁷ to promote efficient, effective, orderly and timely negotiations towards a resolution of issues respecting Mi'kmaq rights and title. To that end, the Agreement established: (i) objectives for the negotiations; (ii) subject matters that are to be included in negotiations; (iii) process parameters such as interim, or incremental, measures or agreements, approvals, the negotiation process, funding, termination and amendment; and (iv) other conditions that will foster a helpful environment for negotiations.

In August 2010, they concluded an agreement which established 'an independent, clear and efficient means for Canada and Nova Scotia to consult the Mi'kmaq of Nova Scotia on proposed activities or projects'.⁷⁸ The Agreement on consultation is part of the broader negotiations to resolve outstanding questions in relation to Aboriginal and treaty rights and self-government between Canada, Nova Scotia and the Mi'kmaq of Nova Scotia, called the 'Made-in-Nova Scotia Process'. It addresses the direction

⁷⁷ <http://www.aadnc-aandc.gc.ca/eng/1100100031915/1100100031916>

⁷⁸ <http://www.aadnc-aandc.gc.ca/eng/1100100015373/1100100015377>

provided by the Supreme Court of Canada in the 2004 Haida and Taku River decisions regarding the legal duty to consult.

(i) Canada – New Brunswick – Mi’kmaq/Maliseet Consultation Framework: Units of Certification 1 and 4

In September 2011, both levels of government and representatives of the 15 Mi’gmag and Maliseet First Nations of New Brunswick signed the Mi’gmag Wolastoqiyik / New Brunswick / Canada Umbrella Agreement⁷⁹ which established an effective and orderly process to help guide future discussions among the parties towards the conclusion of a tri-partite Framework Agreement on Aboriginal and treaty rights and self-government, and a consultation agreement.

4.5.3 Long Term Objectives (For all UoCs)

DFO’s **vision statement** is to *advance sustainable aquatic ecosystems and support safe and secure Canadian waters while fostering economic prosperity across maritime sectors and fisheries*.

DFO’s **mission statement** is described as: *Through sound science, forward-looking policy, and operational and service excellence, DFO employees work collaboratively toward the following strategic outcomes:*

- *Economically Prosperous Maritime Sectors and Fisheries*
- *Sustainable Aquatic Ecosystems*
- *Safe and Secure Waters*

A. The Atlantic Fisheries Policy Framework (2004)⁸⁰ provides policy direction for the management of fisheries on the Atlantic coast over the long term. It advocates a broad, inclusive approach to fisheries management while managing in a manner consistent with the constitutional protection provided to Aboriginal and treaty rights. The framework identifies two core objectives and two supporting objectives. These four objectives describe the outcomes that Fisheries and Oceans Canada will strive to achieve in collaboration with resource users and others who have an interest in the Atlantic fisheries. The principles that underpin these objectives and strategies are outlined below⁸¹.

The two core objectives are:

Conservation and Sustainable Use

Conservation of marine resources and habitat, and rebuilding of resources and restoration of habitat where necessary, will remain the highest priority for the management of all fisheries. Within the limits of available knowledge, all fishing activities will be conducted in a manner that leads to sustainable levels of resource use.

⁷⁹ <http://www.aadnc-aandc.gc.ca/eng/1315679203831/1315679413935>

⁸⁰ <http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm>

⁸¹ Supporting policies and strategies in support of the AFPR objectives and principles are described in the aforementioned footnote.

Self-reliance

Self-reliant fisheries and collaboration among all orders of government will contribute to the well-being of coastal communities. To be more self-reliant, resource users will have more flexibility to make decisions about their own economic and social objectives.

The two supporting objectives are:

Shared Stewardship

Participants will be effectively involved in fisheries management decision-making processes at appropriate levels; they will contribute specialized knowledge and experience, and share in accountability for outcomes. Achieving shared stewardship requires:

A Stable and Transparent Access and Allocation Approach

The access and allocation of fisheries resources will be more stable and predictable, and decisions will be made and conflicts resolved through fair, transparent and rules-based processes

The principles that underpin these objectives and strategies are outlined below. They are intended to guide decision making on management of the Atlantic fisheries. They will also serve as a tool for evaluating future fisheries management policies and decisions and ensuring their coherence with the framework's objectives. There are nine principles:

- **Conservation of fisheries resources and habitat** — defined as sustainable use that safeguards ecological processes and genetic diversity for present and future generations — is the first priority of fisheries management decision making;
- The fishery is a **common property resource** to be managed for the benefit of all Canadians, consistent with conservation objectives, the constitutional protection afforded Aboriginal and treaty rights, and the relative contributions that various uses of the resource make to Canadian society;
- The **Minister of Fisheries and Oceans**, on behalf of all Canadians, **retains authority** for the sustainable use of fisheries resources and their habitat, and for the access and allocation thereof;
- Fisheries and Oceans Canada recognizes the **historic and continued importance of commercial fisheries** on the Atlantic Coast as well as the legitimacy and importance of other users, such as recreational fishers and aquaculturists;
- Governments, resource users and others with an interest in the fisheries **share responsibility** for the sustainable use and economic viability of fisheries;
- Fisheries management decision-making processes will provide opportunities for **increased Aboriginal participation and involvement**;
- Fisheries management **decision-making processes** must be, and must be seen to be, fair, transparent and subject to clear and consistent rules and procedures;
- Fisheries management **decision-making processes** will be more inclusive so that resource users and others will have appropriate opportunities to participate; and

- **Operational decision making** affecting specific fisheries will normally be made as close to those fisheries as possible and will primarily involve resource users.

B. DFO's **Sustainable Fisheries Framework**⁸² provides the basis for ensuring Canadian fisheries are conducted in a manner which support 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 Framework 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.

(1) **Conservation and Sustainable Use policies** incorporate precautionary and ecosystem approaches into fisheries management decisions to ensure continued health and productivity of Canada's fisheries and healthy fish stocks, while protecting biodiversity and fisheries habitat. Combined, these policies demonstrate Canada's commitment to the principles of ecosystem-based fisheries management. These policies include:

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

(2) The application of the sustainable use policies will be implemented into the fisheries management process through various **Planning and Monitoring Tools**. Integrated Fisheries Management Plans identify goals related to conservation, management, enforcement, and science for individual fisheries; and they describe 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 has developed additional strategic policy frameworks such as for Integrated Fisheries Resource Management, Sustainable Aquaculture, Species at Risk, Integrated Ocean Management, and Aquatic Invasive Species. These also contain long term objectives with implications for the fishery and are presented elsewhere in this report.

C. The aforementioned departmental mission statement is supported by long term strategic objectives pursuant to DFO's **Fisheries Renewal Initiative**⁸³. These objectives include:

⁸² <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>

⁸³ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/index-eng.htm>; several components of the AFPR have since been integrated into the Fisheries Renewal Initiative.

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

D. Lastly, DFO's Gulf and Maritimes Regions' fisheries management programs are informed by five overarching strategic objectives which embrace an **Ecosystem Approach to Management**. These include:

- **Conservation objectives**

Productivity: Do not cause unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem.

Biodiversity: Do not cause unacceptable reduction in biodiversity in order to preserve the structure and natural resilience of the ecosystem.

Habitat: Do not cause unacceptable modification to habitat in order to safeguard both physical and chemical properties of the ecosystem.

- **Social, cultural and economic objectives**

Culture and Sustenance: Respect Aboriginal and treaty rights to fish.

Prosperity: Create the circumstances for economically prosperous fisheries.

The conservation objectives require consideration of the impact of the fishery not only on the target species but also on non-target species and habitat.

The social, cultural and economic objectives reflect the Aboriginal right to fish for food, social and ceremonial purposes. They also recognize the economic contribution that the fishing industry makes to Canadian businesses and many coastal communities. Ultimately, the economic viability of fisheries depends on the industry itself. However, DFO is committed to managing the fisheries in a manner that helps participants be economically successful while using the ocean's resources in an environmentally sustainable manner.

4.5.4 Incentives for Sustainable Fishing (For all Uocs)

DFO has developed and implemented a Sustainable Fisheries Framework which builds on existing fisheries management practices to form a foundation for implementing an ecosystem based and precautionary approach to fisheries management and to ensure continued health and productivity while protecting biodiversity and fisheries habitat. The primary goal of the Framework is to ensure that Canada's fisheries are environmentally sustainable, while supporting economic prosperity.

Consistent with Principles 1 and 2, no apparent capital or operating subsidies are offered by governments to Nova Scotia and New Brunswick lobster harvesters that would contribute to unsustainable fishing practices. A \$50 million government/industry funded program, known as the

Atlantic Lobster Sustainability Measures⁸⁴ (ALSM) was established by DFO in 2009 to assist individual LFAs to develop lobster sustainability plans that would ensure lobster stocks remained healthy and robust, improve lobster abundance in areas where stocks have declined, and support economic prosperity by helping to set the conditions for commercial success. In Eastern NB and Gulf NS, ALSM projects were implemented in LFA 23, 25 and 26 A&B. The majority of these projects were focused on lobster effort rationalization (permanent licence retirements coupled with trap limit reductions) and were successfully concluded by March 2014.

The Fundy North Fishermen's Association voluntary completed a ghost gear and marine debris removal at the mouth of the Bay of Fundy (LFA 36) in summer and fall 2013. The purpose of this ALSM project was to reduce threats to marine mammals due to lost gears.

ALSM projects were implemented in LFA 27, and were focused on science projects to collect, analyse and disseminate biological data which would contribute towards the management and biological sustainability of the lobster fishery industry, and governance projects to improve the LFA 27 Management Board capacity and better align the governance structure with the needs of fishermen. (Brzeski 2011, 2014).

There are several important incentives within the management regime's regulations, licensing policies and licence conditions for the inshore lobster fishery that promote and contribute to sustainable fishing practices. Examples include: security of access, the ability to transfer licences to new entrants or to combine existing licences on one vessel (referred to as stacking or shared partnering), and a stable enterprise revenue stream all serve to protect the licence holder's investment and add value to his commercial lobster fishing licence over time. These economic incentives contribute to the fishery's sustainability by motivating licence holders to protect the resource, focus on maximizing value over volume, and minimizing impacts of the fishery on marine habitat and the ecosystem.

The lobster fisheries in all 4 Units of Certification are managed by input controls, meaning specific limits are placed on fishing effort. These input controls are supported by regulations and licence conditions and constitute LFA-specific enforceable measures. Many of the following measures are common to all 4 Units of Certification:

- Fixed number of license holders (limited entry), seasons and trap limits;
- Prescribed trap design (maximum volumetric dimension, escape vents, biodegradable twine);
- Protection of egg-bearing females and V-notching;
- Minimum carapace and maximum window sizes;
- Closed areas and times, including conservation and scallop exclusion zones;
- Ongoing monitoring and enforcement of regulations and license conditions;
- Industry-promoted lobster handling and quality workshops, and fisher-led lost/abandoned gear recovery activities;
- Industry-led in-season lobster monitoring and research programs in many LFAs; and

⁸⁴ <http://www.dfo-mpo.gc.ca/fm-gp/pesches-fisheries/fish-ren-peche/lobster-homard/alsm-mdih-eng.htm>

- Fishing practices i.e. multiple traps per line reduces fishing pressure and operating costs, use of sinking lines between traps minimizes trap movement.

All licence conditions reviewed by the assessment team for each LFA contained measures to protect species-at-risk, vulnerable marine habitat, and biodiversity (sponges/corals closed areas or others). Visible and effective surveillance and enforcement activities minimize the likelihood of unauthorized fishing or landing illegal lobster; an effective system of court-imposed fines, forfeitures and licence suspensions, and media scrutiny of violators all serve to promote compliance, sustainable fishing practices and resource conservation.

Whereas most bycatch species in the lobster fishery are not retained and it is time consuming and costly to separate bycatch, there is an incentive to avoid catching these species. Industry-wide acceptance in all LFAs of the use of trap escapement panels indicates that harvesters recognize both the importance of bycatch avoidance from a financial cost perspective, and the value of maintaining biodiversity and a healthy ecosystem. In combination, these systems, measures and practices engender a strong sense of stewardship toward the resource, habitat and the ecosystem, and support sustainability objectives.

Management policy and procedures for the lobster fishery are reviewed regularly, normally at the end of each fishing season. This review is done internally at DFO and externally through the various local and regional advisory committees, as well as by the Scotia-Fundy Roundtable in regard to the Maritimes Region's broad range of strategic fisheries and oceans policies. The annual DFO internal review also serves to update the Fisheries Sustainability Checklist (an internal management tool used to monitor progress on sustainability initiatives).

During the April 2014 site visits, DFO and Industry representatives reported that the management system for the fishery is generally proactive in anticipating potential issues that could give rise to negative economic or social incentives. This is characterized by thoughtful analysis of their impacts and acting on a timely basis to ensure incentives support sustainable fishing. Industry representatives also commented that their decision to seek MSC certification of the lobster fisheries was indicative of their commitment to sustainable fishing practices. Other practices championed by Industry include the Maritime Fishermen's Union's Clean Oceans Project and advocating in support of science-based rationales when considering changes to the fishery's management measures.

4.5.5 Fishery Specific Objectives

(a) LFA 23, 25 and 26A&B – Unit of Certification 1

DFO's set objectives for the commercial lobster fishery of the Southern Gulf of St. Lawrence, those objectives are presented in the approved Integrated Fisheries Management Plan (DFO 2014c). The fishery's objectives suggest linkages to the requirements associated with MSC Principles 1 and 2. They include short-term, mid-term and long-term objectives to achieve conservation of the stock, habitat and the ecosystem. DFO is committed to managing the fishery in a manner that helps industry stakeholders and aboriginal organizations to be economically successful while using the ocean's resources in an environmentally sustainable manner. A summary of these objectives is provided:

- **Stock conservation:** Improve data gathering to determine spatial impact of the fishery, reduce dependency on new recruits, protect reproductive potential, and define biological reference points;

- **Ecosystem:** Minimize incidental catch of non-commercial lobster and other species, complete a coastal mapping program including lobster habitat, and mediate collateral effects of the fishery;
- **Stewardship:** Provide timely and inclusive industry engagements, maintain a transparent working relationship and build a collaborative approach among the various stakeholders; and
- **Social, cultural and economic:** Promote an efficient and orderly fishery and high-quality product, and provide a stable, transparent and predictable means of managing the fishery.

The proposed timeframes associated with the implementation of these objectives are set out in Table 50.

Table 52. Proposed Timeframes for Implementing IFMP Objectives.

Strategic Objectives	IFMP Implementation Timeframes		
	Short term	Medium term	Long term
Stock Conservation	Implement a data collection program that includes information on the amount and distribution of fishing effort.	Reduce the exploitation rates to lessen the risk of recruitment overfishing.	Ensure the reproductive potential of the stock is preserved by implementing all of the elements of the Precautionary Approach.
Ecosystem	Minimize incidental catches by ensuring that trap configuration allows for the escape of undersized lobster as well as an effective biodegradable escape mechanism	Complete coastal mapping to include the identification of types of lobster habitat.	Ensure that any potential collateral effects the fishery has on other species is mediated.
Stewardship	Continue to hold Southern Gulf Lobster Advisory Committee meetings at predetermined frequencies.		Continue to have an open and transparent working relationship with industry stakeholders and build a collaborative approach between and among stakeholders.
Social, Cultural and Economic	Promote a high quality product through management measures that encourage the harvesting of a high quality product. Promote a fishery that operates in an efficient and orderly manner.	Stabilize longer term access to the resource to encourage long term industry business plans. Work with fleets who wish to pursue fleet restructuring.	Provide stability, transparency and predictability in the management of the fishery.

Activities in support of stock assessment and monitoring are carried out on a regular basis and data are collected and used to maintain knowledge about the status of the fishery. Information collected and reviewed annually includes both fishery independent (trawl survey, SCUBA survey) and fishery

dependent (at sea sampling, experimental trap, and larval collectors) sources. A peer-reviewed precautionary approach framework for the fishery has been finalized and is expected to be published and posted on the CSAS website shortly⁸⁵. DFO has made a commitment and is proceeding to assess various reference points based on the stock's biological characteristics with the objective of implementing biological reference points. Subsequent to establishing reference points, formal harvest control rules will be developed.

The IFMP's Performance Review section identifies priorities regarding management and conservation. These are intended to provide the means to assess progress on an ongoing basis and achieve the IFMP's stated objectives. Though management of the fishery strives to meet both social and economic objectives, the overriding objectives are stock, habitat and ecosystem protection. The review indicators are characterized as being both qualitative and quantitative, and supporting MSC Principles 1 and 2.

(b) LFAs 27-33, 34, and 35-38: Units of Certification 2, 3 and 4

DFO Maritime's objectives, strategies and tactical management measures for the commercial lobster fishery in LFAs 27-33, 34 and 35-38 are outlined in the 2011 Integrated Fisheries Management Plan.⁸⁶ The Plan was developed in conjunction with lobster harvesters, and reflects an ecosystem approach, employs co-management, and promotes shared stewardship all of which combine to ensure sustainability of the fishery.

Conservation Objectives

As reported, the overarching conservation objective is to allow sustainable use that safeguards ecological processes and genetic diversity for present and future generations. Productivity is currently the primary conservation objective for all of the region's LFA. In addition, DFO's conservation objectives for the fishery are intended to not cause unacceptable:

- reduction in productivity so that components can play their role in the functioning of the ecosystem;
- reduction in biodiversity in order to preserve the structure and natural resilience of the ecosystem; and
- modification to habitat in order to safeguard both physical and chemical properties of the ecosystem.

Social, Cultural and Economic Objectives

DFO Maritimes' social, cultural and economic objectives for the lobster fishery include:

- supporting healthy and prosperous Aboriginal communities, and respecting the constitutional protection afforded Aboriginal and treaty rights; and
- creating the circumstances for economically prosperous fisheries wherein fishing enterprises are more self-reliant, self-adjusting and internationally competitive while using the ocean's resources in an environmentally sustainable manner.

Specific Fishery Strategies

⁸⁵ DFO 2014. Reference points options for the southern Gulf of St. Lawrence lobster stock. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/nnn. This report is the result of the Science Special Response Process of November 21, 2013.

⁸⁶ <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/maritimes/insholob-2011-eng.htm>

These aforesigned objectives are translated into practical terms through the definition of strategies that define what is being done to manage pressures imposed by fishing activities in order to control their impact on fish population and ecosystem attributes. Pressures include fishing mortality, disturbance of bottom habitat and introduction of pollutants. Fish population attributes include spawning biomass, size/age structure, and genetic diversity. Similarly, ecosystems attributes include the area of a particular habitat type and the balance of predators to prey.

A. Conservation

Explicit strategies (with specified references where these have been developed) have been developed for the key pressures imposed by the inshore lobster fishery, as follows.

Productivity

- Keep lobster fishing mortality moderate;
- Keep fishing mortality moderate for by-catch species, i.e. Jonah crab, rock crab;
- Allow sufficient escapement from exploitation for spawning; and
- Limit disturbing activity during important reproductive seasons

The IFMP notes that the strategy for moderating lobster fishing mortality is provisional, and work will be carried out over the next few years to refine the strategy in accordance with the Department's policy on the precautionary approach. In addition, consideration will need to be given to accounting for incidental mortality from lost lobster traps as well as to developing reference points for the retained bycatch species.

Biodiversity

- Control unintended incidental mortality of North Atlantic right whales; and
- Control unintended incidental mortality of other species

The contribution of the inshore lobster fishery to the mortality of North Atlantic right whales cannot be quantitatively measured. Nevertheless, since right whales are endangered efforts will continue to keep interactions with them as low as practicable.

The need to develop more specific strategies and reference points for other species will be considered as the impact of the inshore lobster fishery on by-catch becomes better understood. Additional data on discards from the fishery was collected in 2009, and analysis of this data will be available in the near future.

Habitat

- Manage area disturbed of bottom habitat;
- Limit introduction of pollutants; and
- Minimize introduction of debris

Currently there are two Marine Protected Areas and two coral closures in the Maritimes Region, with broad restrictions on fishing. While these areas are outside the areas fished by the inshore lobster fleet, they nevertheless form part of a strategy within the region for managing the disturbance of bottom habitat. The need for the inshore lobster fishery to adopt additional, more specific measures to manage disturbance of bottom habitat will be considered as the Department gains a better understanding of the location of sensitive habitats and their susceptibility to trap fishing. Other

strategies for protecting habitat are to limit the introduction of pollutants and debris (oils, plastic straps, bait boxes, tags, etc.) from the large number of vessels used in this fishery.

B. Social, Cultural and Economic

The strategy for supporting healthy and prosperous Aboriginal communities includes:

- Respecting Aboriginal and treaty rights; and
- Facilitating Aboriginal participation in fisheries and associated economic opportunities;

The strategies for achieving the more general prosperity objective include:

- Offering flexibility in policy and licensing to individual enterprises/licence holders;
- Promoting stability in access to resources and allocations;
- Providing internal mechanisms that allow self-adjustment of capacity to resource availability; and
- Supporting certification for sustainability

Tactical Management Measures

Tactical management measures are “how” the strategies will be implemented to manage the pressures imposed by fishery activities. The principal tactical management measures that will be applied in this fishery to implement the key strategies identified are described here. (Note that tactics may regulate more than one pressure. They are listed here under the strategies that they are most strongly associated with.)

Productivity

Keep lobster fishing mortality moderate:

- Limited entry;
- Prescribed access areas (LFAs);
- Trap limits;
- Minimum legal sizes;
- Window in some LFAs (i.e. release of mid-sized lobsters);
- Seasons (i.e. closures during spawning/molting/extrusion periods);
- Gear fitted with escape vents and biodegradable panels; and
- Studies on improving gear efficiency and selectivity

Keep fishing mortality moderate for by-catch:

- Minimum legal size of Jonah crab; and

- Gear fitted with escape vents and biodegradable panels

Allow sufficient escapement from exploitation for spawning:

- Release of berried female lobsters;
- V-notching of berried female lobsters;
- Release of female Jonah and rock crab; and
- Allow sufficient escapement from exploitation for spawning

Biodiversity

Control unintended incidental mortality of North Atlantic right whales:

- Voluntary standards of practice developed with the World Wildlife Federation (e.g., avoidance protocols, gear setting techniques); and
- Outreach and information provided to harvesters

Control unintended incidental mortality for other species:

- Gear fitted with escape vents and biodegradable panels; and
- Completion of SARA monitoring documents

Habitat

Manage area disturbed of bottom habitat:

- Coral closures;
- Marine Protected Areas; and
- Gear handling (weighted traps, proper hauling)

Limit introduction of pollutants:

- Periodic reminders at meetings of proper disposal of waste material; and
- Minimize introduction of debris

Prosperity

Facilitate Aboriginal participation in fisheries and associated economic opportunities, and in the management of aquatic resources:

- Provide for food, social and ceremonial fisheries for First Nations; and
- Continue to meet the *Marshall Response Initiative* for the lobster fishery

Offer flexibility in policy and licensing:

- Maintain the allowance for the formation of partnerships and stacking of licences so fleets may rationalize capacity during periods of changing price or abundance

Promote stability in access to resources and allocations:

- Limit entry to fishery through licensing policy so that licence holders may develop long-term business plans

Allow self-adjustment of capacity to resource availability:

- Maintain the allowance for the formation of partnerships and stacking of licences so fleets may rationalize capacity during periods of changing price or abundance

Support certification for sustainability:

- Collect data on discards of some crab species; and
- End of season submission of SARA reporting document

4.5.6 Decision-Making Process (For all UoCs)

Some exceptions notwithstanding, the decision-making process associated with the more important commercial fisheries of Atlantic Canada and Quebec revolves primarily around fish harvest considerations (TACs, fleet access and allocation, sharing arrangements, harvest control rules, socio-economic implications, species-at-risk, and habitat/ecosystem interactions). Decisions are either made by the Minister or the Regional Directors General. Ministerial authority is typically required for the multi-regional fisheries, international fisheries, and fisheries that are deemed ‘sensitive’ such as lobster fisheries⁸⁷.

The decision-making process for the Southern Gulf Lobster Fishery and the Scotia-Fundy/Maritimes Lobster Fishery is not unlike the process in use for all major commercial fisheries in Atlantic Canada and Quebec. In view of the importance of the management measures and engagement processes in use, DFO’s Fisheries and Aquaculture Management organizations (specifically Resource Management) at the local, regional and national levels play a critical role in the departmental decision-making process.

Decision memoranda along with relevant attachments are required when seeking decisions from the Minister or the Regional Directors General. The purpose of these memoranda is to provide information about a fishery or an issue along with options and recommendations for decision-making. The decision memoranda ensure that all internal and industry stakeholders’ perspectives are reflected and that positive and negative outcomes for each option are described. Resource Management is responsible and accountable for the development of these memoranda. The development of the decision memoranda is generally initiated by the post-seasonal review of a fishery to present recommendations for next cycle’s fishery management. However, it can also be triggered during the season when an important issue arises (i.e. new information found by Science).

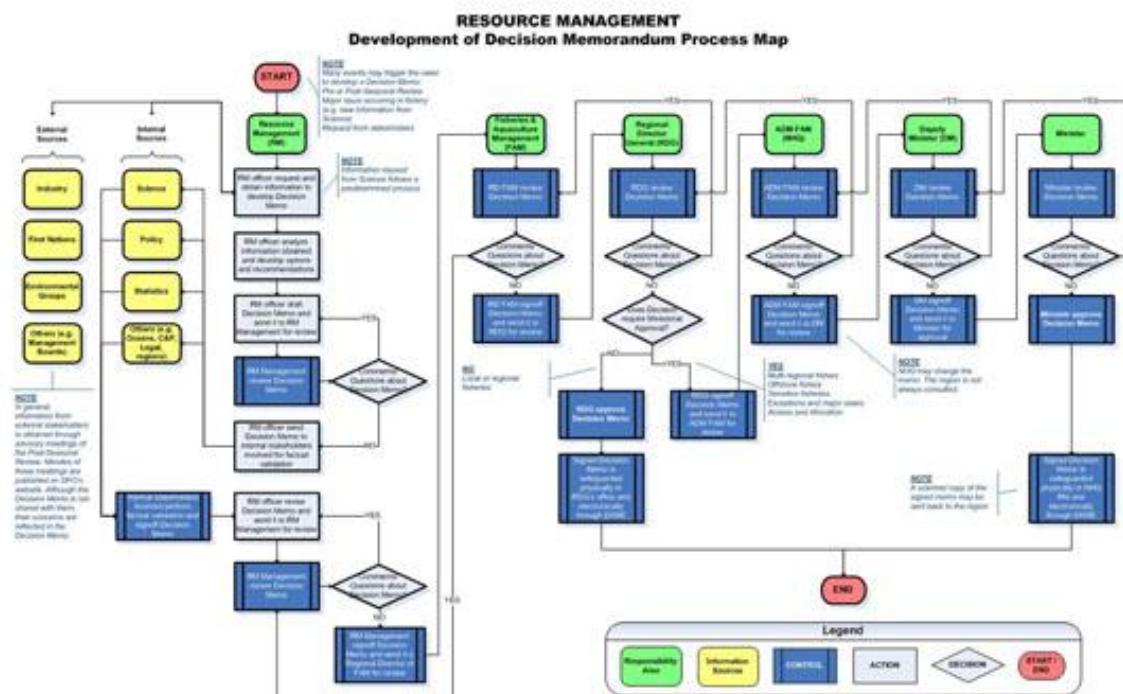
As noted previously, an advisory committee is established for each major commercial fishery. As part of the post-seasonal review, all participants of the advisory committee meet through a consultation meeting. Prior to the consultation meeting however, Resource Management would request information

⁸⁷ <http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/09-10/6B205-eng.htm#ch3.1>

from all applicable sectors, namely, Science and Policy and Economics. After the consultation meeting, information from all stakeholders is consolidated by Resource Management.

The outputs of Resource Management decisions have a high impact on sustainability of fisheries and economic viability. This is particularly true for commercial fisheries that transcend provincial or DFO administrative boundaries where competing stakeholders' interests and agendas must be balanced against the strategic objectives for the fishery as a whole.

The following figure illustrates the various steps associated with a typical Resource Management decision-making process for inter-provincial and inter-DFO regional commercial fisheries.



There is an annual recurring fishery management cycle for the Southern Gulf and Scotia-Fundy/Maritimes lobster fisheries. During the fishery, information and data are collected by various DFO sectors (Science, Fisheries and Aquaculture Management, Policy and Economics) and a variety of stakeholder groups usually through partnership agreements or protocols with DFO (eg. Fish Harvester Organizations, Aboriginal Organizations, various NGOs, and academic institutions).

DFO Gulf has acknowledged concerns over the lack of reliable, verifiable and accurate information from the southern Gulf of St. Lawrence lobster fishery, specifically in regards to fishery-dependent data. A similar acknowledgement was conveyed to the Assessment Team by DFO Maritimes in regard to fishery independent data. What data are collected by DFO Gulf (purchase slips and a planned resumption of fisher-generated logbook data beginning in 2014) are not considered sufficient to meet the mid to long-term objectives set out in the approved IFMP and are the source of some risk in regard to the formulation of scientific advice. The development and introduction of an electronic logbook system for the lobster fishery is envisioned pursuant to the approved IFMP. It has the support in principle of the fishing industry; however details regarding costs, technology and operations remain to

be fully considered.

The fisheries management decision-making process for this fishery is characterized by transparency and informed judgments in which the views and opinions of departmental, industry and provincial government representatives are encouraged and considered. This is also true of DFO's science stock assessment process prior to the publication of CSAS documents. Decisions regarding the management measures including harvest control rules for the NB and NS lobster fisheries are finalized following the conclusion of the advisory and RAP processes. These are communicated to the industry and general public via DFO Gulf's regional website as Notices to Harvesters and /or as Orders prior to the commencement of the fishery.

4.5.7 Monitoring, Control and Surveillance

The monitoring, control and surveillance (MCS) function is assigned to DFO's Conservation and Protection (C&P) program which seeks to facilitate public compliance with applicable Acts and supporting regulations relating to the conservation and sustainable use of Canada's fisheries resources, the protection of species at risk, fish habitat and oceans. The Director General of C&P, as the senior DFO enforcement officer, promulgates technical policies and procedures to facilitate the delivery of the department's compliance and enforcement program. Program delivery is highly decentralized under the Regional Directors General. The Directors of C&P for the Gulf and Maritimes Regions have direct line authority over Area-level C&P Fishery Officers, reports to the Regional Director of Fisheries and Aquaculture Management, and receives functional guidance and direction from the Director General at National Headquarters.

National Program Internal Audit

In 2012, C&P national conducted an audit of Commercial and Aboriginal Fisheries⁸⁸ which determined that overall the Conservation and Protection governance framework and control activities for commercial and aboriginal fisheries were well established; however, the program was currently not assessing the effectiveness of the controls to ensure that compliance with relevant regulations and legislation was being achieved and maintained. The Audit Team identified the following observations:

- The Conservation and Protection governance framework is well established and operational plans are linked to Fisheries and Oceans Canada's strategic outcome for sustainable fisheries. However, the collaborative relationship between Conservation and Protection and Resource Management with regards to initiatives within Ecosystems and Fisheries Management needs improvement;
- The selection and review of control activities for commercial and aboriginal Fisheries does not effectively include consideration of their relevance and appropriateness to the risk and related objective. The allocation of resources is not aligned to Conservation and Protection's enforcement strategy;

⁸⁸ <http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/11-12/6B236-eng.htm>

- The intelligence-gathering systems and processes do not allow Conservation and Protection to share intelligence across regions nor do they assist in determining where to effectively focus enforcement efforts;
- Performance measures have been identified; however, the performance indicators are largely output based and do not provide useful information in terms of results to allow the program to adjust course as needed to ensure compliance efforts are strategically focused. Financial controls are appropriate to carry out operational plans. There is adequate monitoring of budgets, forecasts, and resource allocations. However, the manner with which funds are allocated to Major Case Management and special investigations does not adequately address the financial needs of this activity; and
- Conservation and Protection lacks a national training program for Major Case Management and Special Investigations.

DFO Management was reportedly in agreement with the audit findings and recommendations and undertook to develop Action Plans along with implementation timeframes. The following email response from DFO C&P Management was provided to the assessment team on January 29, 2014.

In the March 2012 Audit report of Commercial and Aboriginal Fisheries – Conservation and Protection, the auditors commented that C&P had developed a Performance Measurement Strategy but that this document focused primarily on output-based measures which aren't a true measure of the program's effectiveness. In the report, it acknowledges that Conservation and Protection has provided some national direction. To date, this has primarily been in the form of discussions with regions in terms of the need to develop outcome-based performance indicators. While there has been considerable discussion on these, a full suite of outcome-based indicators has not yet been developed. Most regions continue to assess their performance based on output indicators through the Operational Planning and Budgeting Program process.

There is a national initiative underway to develop a National Catch Monitoring and Reporting Framework which will feed into any regional efforts in this area. This is a multi-year initiative and will be referenced in the 2014-15 Report on Plans and Priorities for DFO - C&P.

National Conservation and Protection Compliance Framework

The Department has in place a national framework consisting of strategies and related components which collectively serve to guide the planning and delivering of the program across DFO's six administrative regions. The framework was provided to the assessment team in the form of a pamphlet. It consists of three "pillars" which are intended to also support the Department's vision and mission statements noted previously. The pillars and their components are summarized as follows:

1. Education and Shared Stewardship (Building support for the Future)

Informal Education: informal interactions with clients and stakeholders at wharves, on general patrols and at community events;

Formal Education: presentations to client/stakeholder groups including school visits or community programs; formal advertisements/promotion campaigns; and

Co-Management/Partnerships: promoting engagement of clients, NGOs and other interest groups in management and compliance decisions; promoting stakeholder engagement and participation in the delivery of compliance functions; ensuring consideration of compliance in the development of IFMPs; promoting client funding of compliance activities; promoting the use of "resource-oriented" court orders.



2. Monitoring, Control and Surveillance (Traditional Enforcement Activities)

Departmental MCS Programs: regular land, air and sea patrols, inspections, surveillance and stakeholders; audits of third-party service providers; general plant/buyer inspections;

New Technologies: vessel monitoring system, mobile office, electronic logbooks, remote monitoring;

Third Party Monitoring Activities: at-sea and dockside observers; and

Inter-agency Partnerships: Department of Justice (regulatory initiatives, prosecutions); Royal Canadian Mounted Police and Canada Revenue Agency; provincial and municipal agencies.

3. Major Case Management (Enhanced Investigative Capacity)

Formal Intelligence Gathering and Analysis: inter-agency intelligence networking and resource exchange programs;

Retroactive Offence Detection and Investigation: alignment of inter-departmental and inter-governmental data collection processes and systems; and

Training and Recruitment of Specialized Skills: specialized warrants; computer forensics; fishery profiling; undercover agent operations; data analysis.

A. MCS in Eastern NB and Gulf NS (LFAs 23, 25 and 26 A&B – Unit of Certification 1)

The C&P organization in Eastern New Brunswick consists of seven detachments in LFA 23 and three in LFA 25; a total of 59 Fishery Officer full-time positions are assigned to these offices. Each detachment is headed by a District Supervisor who reports to the Area Chief in Tracadie-Sheila. Officers carry out their operational duties on land, at sea and in the air.

In the Gulf Nova Scotia area, the C&P program consists of 17 Fishery Officer full-time positions deployed across three detachments, one in LFA 26A and two in LFA 26B. As in Eastern NB, each detachment is managed by a District Supervisor with an identical operational reporting scheme. The area is also home to the Pt. Caveau, a 50-foot Canadian Coast Guard vessel that may be used to assist the fisheries enforcement program as required. The C&P vessel fleet for the southern Gulf was recently upgraded with the addition of the midshore patrol vessel *Stan Dudka*.

A comprehensive MCS scheme exists for the Eastern New Brunswick and Gulf Nova Scotia lobster fishery thus ensuring that the fisheries management measures and other requirements are enforced and complied with to an acceptable standard. The regional C&P program is delivered through a balanced regulatory management and enforcement approach which includes: (i) promotion of compliance through education and shared stewardship, (ii) MCS activities, (iii) management of major cases/special investigations, and (iv) compliance and enforcement program resources. Strategic management of the program is guided by a comprehensive Compliance and Enforcement Strategy which guides the operational activities of the regional corps of Fishery Officers based on planning and priority-setting outcomes.



DFO Fast Response Zodiac



DFO Fixed Wing Surveillance Aircraft

Access and effort are regulated through LFA-specific fishing areas, seasons, gear specifications, minimum legal carapace size, and vessel and crew registration. Area C&P Officers conduct fisheries surveillance activities using boarding platforms for marine patrols and aircraft for aerial sorties as

required. Dockside inspections are also performed. The region's statistical information systems track catch data from landings/purchase slips (and, in 2014, catch and effort data from fisher logbooks).

Licence conditions stipulate that fishers are required to embark at-sea observers for independent monitoring and scientific data collection purposes at the discretion of the department. In reality, observers are not deployed to the lobster fleets given the limited work space on board the vessels. The industry has steadfastly opposed a dockside monitoring program for the fishery on the basis on costs and impacts on revenues. Similarly, a Vessel Monitoring System is not in effect for the same reasons.

Compliance and Enforcement Strategy

The Gulf Region's C&P Program has a comprehensive compliance strategy in place for the commercial fisheries managed by the region. The strategy was presented to the assessment team during a previous site visit (January 21, 2014) to DFO Headquarters in Moncton, New Brunswick. As some aspects of the strategy might be considered enforcement sensitive, only the highlights are summarized here.

- *Description:* the strategy promotes and maintains compliance with legislation, regulations and management measures to achieve the conservation and sustainable use of Canada's aquatic resources, and the protection of species at risk, fish habitat and oceans.
- *Delivery:* the strategy is delivered through a balanced regulatory, management and enforcement approach which include education and shared stewardship, MCS activities, management of major cases and special investigations, and program resources.
- *Planning:* annual work plans are prepared at the local level in consideration of operational priorities, industry feedback and recommendations, budgetary and equipment requirements; local plans are rolled up at the regional level where additional planning takes place, including addressing new operational requirements that arise from changes to the resource management functions.
- *Priority-Setting:* operational priorities are established by C&P management staff where in most cases, fishery conservation requirements take precedence and are supported by a comprehensive air-land-sea presence, intelligence gathering, and advances in new technology.
- *Evaluation:* year-end operational reviews take place at the local and regional levels based on input from C&P staff, other DFO programs, and stakeholders. The results of these reviews serve to inform the planning cycle for the subsequent year.

According to information contained in the provisional IFMP for the Southern Gulf commercial lobster fishery, the compliance activities carried out by C&P include:

- A. Land-based patrols – catch inspections, fishing gear inspections, licence checks, and both overt and covert patrols
- B. Sea patrols – vessel inspections to check lobster gear and catch as well as licence verifications
- C. Aerial patrols – surveillance of closed areas and periods, and investigating unauthorized activities
- D. Detachment Supervisors – prepare annual work plans in which they allocate human, materiel and financial resources, and establish priorities
- E. Program staff assists in making recommendations and /or proposing solutions to issues that arise during the fishing season

The program attaches considerable attention and devotes dedicated resources to the region's shared stewardship initiatives and to interactions with key stakeholders. Examples of activities undertaken on a regular basis include:

- An annual enforcement roundtable to review the program's performance, address shortcomings and challenges, explore solutions, improve program services, and maintain positive relationships
- Interactions with fishers and members of the aboriginal communities on the wharves, their fishing vessels and communities
- Participation in community events and school visits
- Community volunteering outside work hours
- Participation in internal regional post-season reviews and analyses to assess the effectiveness of enforcement activities and to develop action plans for implementation in the following season.

The program's effectiveness is evaluated on an annual basis using a number of program performance indicators, such as:

- Total Fishery Officers hours
- Total patrol hours
- Number of fishing vessels checked
- Number of vehicles checked
- Number of persons checked
- Number of gear checked
- Number of sites checked
- Number of violated detected/warnings issued
- Number of resulting charges
- Level of compliance with prohibitions
- Level of compliance with conditions

Understandably, fisheries enforcement is a challenging line of work and well performing programs are costly to operate and sustain. When resources are stretched, managers are required to look deeper and think more strategically into how efficiencies can be best achieved from a smaller fiscal appropriation. One important aspect in this regard is to assess the risks to compliance that may be posed by any number of changes and to design a functioning set of strategies to mitigate any serious negative outcomes. These are presented in Table 53.

Table 53. Enforcement Challenges and Mitigation Strategies in Use.

Compliance Risks	Mitigating Strategies
<u>Catch Reporting</u> <ul style="list-style-type: none"> ▪ Failure to complete logbook ▪ Falsifying logbook entries ▪ Failure to provide logbook 	<ul style="list-style-type: none"> ▪ Conduct at sea and dockside checks ▪ Investigations and covert surveillance ▪ Surveillance/stakeouts ▪ Buyers inspections and audits ▪ Plant inspections and audits ▪ Increase in Fisheries Act section 61 requests (true returns) ▪ Targeted observer coverage as catch reporting cross reference ▪ Seek significant Court sanctions for flagrant cases
<u>Unauthorized Activity</u> <ul style="list-style-type: none"> ▪ Non-compliance with licence conditions ▪ Unlicensed activity 	<ul style="list-style-type: none"> ▪ Use of intelligence directed enforcement ▪ Use of Crime Stoppers (public appeals) ▪ Enhance communication with industry via IFMP process ▪ Covert operations and use of enforcement technologies ▪ Seek significant Court sanctions for flagrant cases
<u>Illegal Fishing Area</u> <ul style="list-style-type: none"> ▪ Fishing in closed areas/periods 	<ul style="list-style-type: none"> ▪ Targeted aerial and at-sea patrols ▪ Enhance communications with industry via IFMP process ▪ Seek significant Court sanctions for flagrant cases
<u>Others</u> <ul style="list-style-type: none"> ▪ Gear conflicts 	<ul style="list-style-type: none"> ▪ At-sea surveillance ▪ Use of Fishery Officer's powers under Fisheries Act ▪ Address during consultation process by seeking industry-led protocol

The following C&P program statistics were provided to the assessment team by NB and NS staff. The program's data are collected and warehoused in DFO's National C&P data base known as FEATS (Fisheries Enforcement and Training Statistics) and are considered reliable and official.

Table 54. C&P Enforcement Activity and Outcomes – LFA 23.

Enforcement Activity (LFA 23)	2011	2012	2013⁸⁹
Total Patrols	722	673	682
Total Patrol Hours	3,038	2,854	2,702
Total Fishery Officers Hours (on patrol)	4,086	3,706	3,425
Total Fishery Officer Effort (Hours)	6,320	5,766	5,326
Vessels Checked	984	779	1,101
Vehicles Checked	2	48	79
Persons Checked	1,541	1,192	1,137
Gear Checked	65,041	102,552	69,065
Sites Checked	946	1,081	1,260

Table 55. C&P Enforcement Activity and Outcomes – LFA 25.

Enforcement Activity (LFA 25)	2011	2012	2013⁹⁰
Total Patrols	553	448	468
Total Patrol Hours	2,725	2,483	2,246
Total Fishery Officers Hours (on patrol)	3,297	2,607	2,400
Total Fishery Officer Effort (Hours)	6,653	7,872	4,093
Vessels Checked	670	371	554
Vehicles Checked	15	45	20
Persons Checked	1,137	638	890
Gear Checked	52,095	11,608	56,178
Sites Checked	729	913	1,012

Table 56. C&P Enforcement Activity and Outcomes – LFA 26A.

Enforcement Activity (LFA 26A)	2011	2012	2013⁹¹
Total Patrols	426	421	507
Total Patrol Hours	1,675	1,692	1,906
Total Fishery Officers Hours (on patrol)	1,767	1,846	1,993
Total Fishery Officer Effort (Hours)	2,331	2,174	2,589
Vessels Checked	1,593	2,001	1,751
Vehicles Checked	18	100	32
Persons Checked	1,721	2,309	1,974
Gear Checked	66,593	90,776	113,663

⁸⁹ A total of 482 lobster licences (Class A, Class B and Communal Commercial) were issued in 2012.⁹⁰ A total of 336 lobster licences (Class A, Class B and Communal Commercial) were issued in 2012.⁹¹ A total of 336 lobster licences (Class A, Class B and Communal Commercial) were issued in 2012.

Sites Checked	629	661	996
---------------	-----	-----	-----

Table 57. C&P Enforcement Activity and Outcomes – LFA 26B.

Enforcement Activity (LFA 26B)	2011	2012	2013 ⁹²
Total Patrols	315	276	199
Total Patrol Hours	1,141	954	719
Total Fishery Officers Hours (on patrol)	1,147	1,020	764
Total Fishery Officer Effort (Hours)	1,590	1,298	937
Vessels Checked	490	497	229
Vehicles Checked	5	14	12
Persons Checked	587	720	394
Gear Checked	28,748	18,086	13,605
Sites Checked	372	406	333

Table 58. C&P Enforcement Actions Taken – Unit of Certification 1 (2011 to 2013)⁹³.

Enforcement Actions Taken	LFA 23	LFA 25	LFA 26 A&B	Total
<u>Charges Laid</u>				
Assault/Obstruction	6	0	1	7
Illegal Buy/Sell/Possess	21	9	17	47
Registration/Licences	4	10	7	21
Species/Size Limit	26	24	2	52
Gear Conflict	2	1	0	3
Area/Time	3	13	5	21
Illegal Gear	15	10	12	37
Other	13	0	2	15
Total	90	67	46	203
<u>Charges Pending</u>				
Illegal Gear	7	1	0	8
Illegal Buy/Sell/Possess	9	0	3	12
Registration/Licences	0	0	1	1
Area/Time	0	0	0	0
Species/Size Limits	0	0	2	2
Gear Conflict	0	0	0	0
Total	16	1	6	23
<u>Seizures (Persons Unknown)</u>				
Area/Time	7	1	4	12
Illegal Gear	31	3	15	49

⁹² A total of 227 lobster licences (Class A, Class B and Communal Commercial) were issued in 2012.

⁹³ Information on enforcement actions taken is logged on a national departmental data base known as the Departmental Violation System (DVS). Data for 2013 is current to March 31, 2014.

Other	2	0	3	5
Total	40	4	22	66
Warnings				
Illegal Buy/Sell/Possess	13	10	40	63
Registration/Licences	9	20	10	39
Species/Size Limit	7	5	10	22
Illegal Gear	27	5	11	43
Area/Time	11	30	3	44
Gear Conflict	3	0	0	3
Other	7	1	2	10
Total	77	71	76	224

During the April 24, 2014 site visit, the C&P representatives were questioned about a number of specific program elements of interest to the assessment team. The responses are highlighted here.

- Sentencing norms have been developed for the benefit of federal prosecutors and serve to ensure consistent sentencing recommendations to the Court, including in the case of repeat offenders.
- The level of fines for undersized and berried lobster has increased significantly over the past 5 years; the level of recidivism is considered to be low.
- Unauthorized lobster fishing by non-licensed individuals (poaching) is taken seriously by staff, the industry and the judiciary. Illegal lobster fishing (poaching) activities are trending upwards in LFA 23 but are on the decline in LFA 25. Unauthorized fishing in LFA 26 is believed to be very low in large part because licensed fishers report suspicious activities to the local Fishery Officer for investigation. Where equipment is seized (a common enforcement practice), the Court will usually order that it be forfeited in addition to any monetary fines that are imposed.
- During the fishing season, equipment belonging to licensed commercial lobster fishers is usually not seized when an infraction is detected because the livelihood of the fisher would be impacted. The illegal retention of fish (undersized or berried lobster) does result in their seizure and the value of the fish is regularly ordered to be forfeited to the Crown in addition to any licence suspension and monetary fines that are imposed.
- NB and NS magistrates have considerable years of experience presiding over fisheries cases and are well versed with the legislation, the importance of the commercial fishery to rural communities, and the public's attitude toward those who fish illegally. While Industry representatives favour Court-ordered licence suspensions, magistrates in Eastern NB (especially) seem reluctant to suspend a licence in every case brought before the Court.
- Approximately 8-12 formal complaints of alleged illegal lobster fishing are registered with C&P staff annually through the longstanding federal Crime Stoppers Program. They are investigated and outcomes are reported to the program (and to the complainants if their identity is known). C&P staff reported that fishers and the general public frequently provide

them with information of suspected illegal activity, and follow-up action is initiated as appropriate.

- The names of persons convicted of fisheries offences are published on DFO's national and regional websites including details of the charges and penalties.⁹⁴ NB and NS media coverage of the lobster fishery regularly includes enforcement and legal outcomes including the names of those charged. These methods serve to inform the public of the department's work, create awareness and promote co-operation all of which allow C&P to allocate resources more strategically. Information provided to the assessment team by fishers during the site visit indicates general satisfaction with DFO's lobster enforcement efforts in Eastern NB and Gulf NS. The team was also informed that Industry fish harvester organizations and DFO non-enforcement staff frequently provide impact statements to the Court prior to sentencing in regard to the impacts of the more serious offences on the resource, habitat and ecosystem.
- Additional information provided by DFO during the site visit indicates that commercial lobster licence suspensions ranging from 1 to 7 days are generally imposed by the Court for the more serious offences in addition to any monetary fine and catch forfeiture. Some licence suspensions are for longer periods of time. When a licence is suspended, the violator must stay ashore at the opening of the lobster fishery for the duration of the suspension. When he is legally permitted to fish, the best grounds have all been taken thereby forcing him to search for alternative spots where catch rates may not be as high. The suspension is a significant monetary penalty in and of itself since the person cannot make up the lost revenues.

Analysis of Selective Enforcement Activity Outcomes

The assessment team was interested in knowing how the enforcement and compliance program in the LFAs for Unit of Certification 1 had performed during the 2011-2013 fishing seasons. Apart from the performance measures and data provided to the team by DFO, no evidence was provided to indicate that DFO had undertaken a regional performance evaluation of the outcomes of the C&P program. The team did note, however, that the 2012 departmental internal audit of C&P's enforcement and compliance program for the commercial and aboriginal fisheries concluded that the performance indicators in use were largely output based and did not provide useful information in terms of results to allow the program to adjust course as needed to ensure compliance efforts were strategically focused. In the absence of departmental outcome-supported performance indicators, the team opted to develop a few of its own in an effort to draw conclusions about how the C&P program for the lobster fishery had performed during the 2011-2013 fishing seasons.

The following table lists the key output indicators which the assessment team judged to be the most appropriate for evaluating certain program performance outcomes. Outcomes were also calculated and conclusions presented. It bears mentioning that performance evaluation should not be based solely on numerical analyses. The aforementioned qualitative outcomes including industry feedback must also be taken into account.

⁹⁴ <http://www.dfo-mpo.gc.ca/media/charges-inculpations/glf-eng.htm>

Table 59. Performance Evaluation of Selective C&P Lobster Enforcement Activity Outcomes – Unit of Certification 1 (2011 to 2013)⁹⁵.

Activity Outcomes	LFA 23	LFA 25	LFA 26 A&B
Total Patrol Hours	2,077	1,469	8,087
Total Vessels Checked	2,864	1,595	6,561
Total Gear Checked	236,658	119,881	331,471
Lobster Licences Issued	674	482	563
Performance Metrics	LFA 23	LFA 25	LFA 26 A&B
Vessels Checked per Patrol Hour	1.38	1.09	0.81
Gear Checked per Patrol Hour	114	82	41

While any number of metrics could have been used to evaluate the performance of the C&P enforcement and compliance program for the NB and NS commercial lobster fishery, the assessment team chose to focus its attention on two specific ones: the number of vessel inspections carried out per effective patrol hour, and the number of lobster traps checked per effective patrol hour.

The frequency of vessel inspections per effective patrol hour varied from 0.81 in LFA 26A&B to 1.38 in LFA 23. The data are somewhat variable from LFA to LFA which is likely attributable to several factors including the concentration of vessels within a given area and time, their proximity to each other, the amount of available lobster ground, the number of set traps per trawl, and the different weather conditions or sea states between the spring and fall fishing seasons. Any one factor or combinations thereof would affect the number of vessels and traps inspected per effective patrol hour. The assessment team calculated the performance metrics on a year-to-year basis (not shown here) and compared the results to the three-year average for the 2011 to 2013 period. The results were found to be quite consistent with the averaged results for all three LFAs. The assessment team, noting the views expressed by industry representatives during the site visit, is of the opinion that the at-sea inspection component of the C&P program for Unit of Certification 1 did perform at a satisfactory level.

Summary of Judicial Decisions

The assessment team obtained violations data from DFO's Departmental Violation System for the years 2011 to 2013 by province, LFA, violation type and court-ordered sanctions (monetary fines, licence suspensions, forfeitures and incarceration time). The following tables summarize these data for Unit of Certification 1.

The dominant lobster violation types in LFA 23 and 25 include using lobster traps that contravene the regulations (e.g. untagged, non-conforming escape panel), having lobster in one's possession when it is illegal to do so (e.g. berried females), and retaining undersized lobster. The Court treats these offences seriously with fines ranging from \$1,000 to \$6,500 coupled with licence suspensions and forfeiture of traps for the more serious offences. Incarceration time was ordered in two instances. In the vast majority of charges laid, the accused entered guilty pleas; a few did not but were found to be guilty. The successful prosecution rate during the three year period was 100%. Fishery Officers reported that the level of recidivism was extremely low (less than 5%) which is a testament to the professional training and experience of the enforcement staff and legal prosecutors, and, perhaps, an indication of the effectiveness of the Court's sanctions.

⁹⁵ For evaluation purposes, it was assumed that all lobster licences issued remained active during the full season in all LFAs.

Table 60. Prosecutorial Outcomes for LFA 23 (2011 – 2013).

Province	LFA	Violation Type	Court Directed Sanctions			
			Fines (\$)	Licence Suspension (Days)	Forfeiture (Traps)	Incarceration (Days)
NB	23	Illegal Gear	25,650	4	82	93
		Illegal Buy/Sell/Possess	16,375			
		Species/Size Limit	25,300	28		
		Assault/Obstruct	3,200			
		Registration/Licence	1,300			
		Area/Time	250			
		Gear Conflict	400			
		Others	3,800			
		Totals	76,275	32	82	93

Table 61. Prosecutorial Outcomes for LFA 25 (2011 – 2013).

Province	LFA	Violation Type	Court Directed Sanctions			
			Fines (\$)	Licence Suspension (Days)	Forfeiture (Traps)	Incarceration (Days)
NB/NS	25	Illegal Gear	2,000		76	
		Illegal Buy/Sell/Possess	6,300	7		40
		Species/Size Limit	10,600			
		Area/Time	6,000		49	
		Totals	24,900	7	125	40

The types of violations prosecuted in LFA 26 A&B between 2011 and 2013 closely resemble those from LFAs 23 and 25. The monetary fines issued by the Court ranged from \$1,000 to \$9,000; however, licence suspensions tend to be levied more frequently in Nova Scotia compared to similar violation types in New Brunswick. As is LFA 23 and 25, Fishery Officers estimated the level of repeat offenders to be under 5 percent. The successful prosecution rate was also 100% as all accused entered guilty pleas.

Table 62. Prosecutorial Outcomes for LFA 26 A&B (2011 – 2013).

Province	LFA	Violation Type	Court Directed Sanctions			
			Fines (\$)	Licence Suspension (Days)	Forfeiture (Catch \$)	Incarceration (Days)
NS	26AB	Illegal Gear	13,500	7	2,037	
		Illegal Buy/Sell/Possess	12,083	10	2,127	
		Species/Size Limit	8,000	1		
		Area/Time	4,000	14		
		Others	250			

		Totals	37,833	32	4,164	
--	--	---------------	---------------	-----------	--------------	--

B. MCS in Coastal NS and the Bay of Fundy (LFAs 27 to 38 – Units of Certification 2, 3 and 4)

Compliance Activities – Inshore Lobster Fisheries

The IFMP for the inshore lobster fisheries of Units 2, 3, and 4 offers a general description of the operational and planning activities carried out by detachment-based Fishery Officers include:

- dockside checks of landings;
- licence checks;
- measure carapace sizes and check lobster abdomens to assess compliance with restrictions on size and egg bearing lobsters;
- conduct additional checks for evidence that eggs may have been scrubbed away or examine tails for v-notching;
- vehicle and plant checks; and
- overt and covert patrols to ensure compliance during both open and closed seasons.

Conservation and Protection (C&P) staff carries out investigations into reports of large scale fraud and collusion. This may involve interaction with other federal, provincial and municipal government agencies. During sea patrols, Fishery Officers conduct vessel inspections to check that traps are properly tagged and have the required escape mechanisms. Officers also conduct sea patrols to remove illegal gear which usually consists of untagged traps set during closed times or in closed areas.

C&P Detachment Supervisors prepare a work plan each year in which they allocate human, material and fiscal resources and establish priorities (the inshore lobster fishery is a priority for almost all C&P detachments). C&P staff may join representatives of other DFO branches to conduct a post season review. These sessions assess how resources were utilised in comparison with the work plan and allow for improvements in upcoming seasons. C&P (in consultation with Resource Management) reserves the right to request at-sea observer coverage where circumstances dictate. In the past, observer coverage has been used to oversee tag replacements at-sea or gear retrieval in certain circumstances.

Routine aerial patrols are conducted in the areas covered by the IFMP. This is a valuable means of ensuring compliance with seasonal and area closures as well as investigating reports of illegal activity in offshore areas.

C&P has commenced using K-9 patrols to assist in lobster enforcement. One dog has been trained to detect lobsters where eggs may have been scrubbed away.

Liaison with enforcement authorities in the United States and other nations which import Canadian lobster is a critical link in achieving improved compliance. For example, border checks by US enforcement officers serve as a powerful deterrent in retention of undersized lobster.

Shared Stewardship and Education Activities

The IFMP notes that shared stewardship and education are to be achieved in the inshore lobster fishery through a renewed emphasis on the importance of C&P communication with the community at large including:

- Presentations to client/stakeholder groups, including school visits or community programs.

- Informal interaction with all parties involved in the fishery on the wharf, during patrols or in the community to promote conservation.
- C&P Supervisors participate in enforcement advisory meetings with industry to determine expectations in relation to monitoring, control and surveillance activities. Fishery Officers try to match these expectations with available resources and incorporate this in their yearly planning profile.
- C&P engages in internal DFO consultation with Resource Management and other DFO branches through post season analysis and other committees to assess the effectiveness of enforcement activities and to develop recommendations for the upcoming season.
- Ongoing discussions with the industry occur on a regular basis at dockside and changes to plans get implemented as required.

Compliance Strategy

The IFMP identifies various compliance risks associated with the lobster fisheries in Units 2, 3, and 4 and proposes mitigating strategies to guide C&P's response activities. The Plan notes that the responses are in addition to annual C&P workplans in support of the delivery of the compliance program at the detachment level.

The Assessment Team understands that the compliance risks identified in the following table were as they were identified by DFO when the plan was formalized in 2011. The risks are, in part, the product of violations data from years prior to 2011, and, therefore, may not be a true representation of the compliance risks in 2014.

Table 63. Compliance Strategy for the Lobster Fisheries in Units 2, 3, and 4.

Compliance Risks	Mitigating Strategies
<u>Illegal Use of Gear</u> <ul style="list-style-type: none"> ▪ Exceeding trap limits by otherwise licensed harvesters ▪ Unauthorized use of licenced traps by persons other than licence holder ▪ Abuse of replacement tag privileges ▪ Use of untagged/sunken/unmarked traps by persons with and without licences ▪ Traps without proper escape mechanisms ▪ Improper gear markings 	<ul style="list-style-type: none"> ▪ Targeted and random inspections of lobster vessels and gear including at-sea or dockside checks ▪ Use high tech equipment to monitor illegal activities ▪ Dragging operations to remove illegal gear ▪ Enforcement meetings with local harvesters to exchange information ▪ High visibility enforcement
<u>Closed Area and Time Issues</u> <ul style="list-style-type: none"> ▪ Illegal, unlicensed, unreported closed season/area fisheries ▪ Incursions into adjacent, non-licensed areas by licensed harvesters ▪ Incursions by US vessels 	<ul style="list-style-type: none"> ▪ Surveillance including stakeouts ▪ Use of high tech equipment to track illegal gear ▪ Aerial surveillance ▪ Joint vessel patrols with RCMP ▪ Sovereignty patrols and flag state enforcement along US boundary

<p><u>Catch Issues</u></p> <ul style="list-style-type: none"> ▪ Transport and sale of illegal catches including undersized, egg bearing lobsters etc. ▪ Retention of undersized, egg bearing, scrubbed or v-notched lobsters ▪ Retention of lobster parts and culls ▪ Marketing of lobsters caught for food and ceremonial purposes ▪ Illegal lobster bycatch in groundfish, crab, and scallop fisheries ▪ Transhipments from vessels not licensed to harvest lobster or from unlicensed areas/vessels 	<ul style="list-style-type: none"> ▪ Intelligence led enforcement ▪ Covert operations ▪ Use of high tech equipment to track illegal catch ▪ Document checks ▪ Monitor and inspect buyers including pounds ▪ Truck stops and border checks in collaboration with US counterparts ▪ Explore partnerships with aboriginal bands to avoid problems with food and ceremonial fisheries
<p><u>Conflicts Between User Groups</u></p> <ul style="list-style-type: none"> ▪ Tensions between communities ▪ Tensions over placement of traps ▪ Tensions between aboriginal and non-aboriginal groups ▪ Gear conflicts with other sectors ▪ Conflicts between Canadian and US harvesters <p><u>Others</u></p> <ul style="list-style-type: none"> ▪ Harmful alteration of habitat ▪ Ghost fishing 	<ul style="list-style-type: none"> ▪ Attempt to resolve these issues through dialogue to enable Fishery Officers to concentrate on other conservation threats ▪ Joint enforcement meetings with local harvesters to monitor and manage unrest ▪ Proactive communications with aboriginal bands and non-aboriginal harvesters ▪ Frequent communications and joint operations with US counterparts in Disputed Zone ▪ Removal and seizure of illegal gear ▪ Constant dialogue with user groups

The following three statistical tables, derived from DFO's Departmental Violations System (DVS), depict the number and type of lobster fishery violations recorded by Fishery Officers during the 2011-2013 period for each of the three Units of Certification.

Table 64. Number of Violations by Type from 2011 to 2013 – Unit of Certification 2 (LFAs 27-33).

Violation Category	2011	2012	2013	Total
Area/Time	4	14	24	42
Assault/Obstruct	1	1	2	4
Illegal Gear/Used Illegally	20	46	25	91
Gear Conflict	0	1	1	2
Illegal Buy/Sell/Possess	52	21	48	121
Illegal Export	0	1	1	1
Illegal Transportation	0	1	0	1
Inspection	0	0	1	1
Registration/Licence	18	20	23	61
Reporting	5	13	111	129
Species/Size Limit	14	13	7	34
Habitat	1	0	0	1

Other Legislation	1	2	2	5
Total	116	133	244	493

Table 65. Number of Violations by Type from 2011 to 2013 – Unit of Certification 3 (LFA 34).

Violation Category	2011	2012	2013	Total
Area/Time	25	8	13	46
Illegal Gear/Used Illegally	23	14	23	60
Gear Conflict	0	0	1	1
Illegal Buy/Sell/Possess	42	48	28	118
Illegal Transportation	0	1	1	2
Registration/Licence	29	46	17	92
Reporting	27	3	4	34
Species/Size Limit	40	15	8	63
Other Legislation	0	2	0	2
Total	186	137	95	418

Table 66. Number of Violations by Type from 2011 to 2013 – Unit of Certification 4 (LFAs 35-38).

Violation Category	2011	2012	2013	Total
Area/Time	13	5	36	54
Assault/Obstruct	1	0	2	3
Illegal Gear/Used Illegally	7	12	12	31
Gear Conflict	1	0	0	1
Illegal Buy/Sell/Possess	20	7	26	53
Registration/Licence	4	4	8	16
Reporting	2	7	1	10
Species/Size Limit	4	1	0	5
Foreign – Unauthorized Entry/Fishing	1	0	1	2
Total	53	36	86	175

The most common violation types encountered in Unit 2 were (i) illegal buy/sell/possess, (ii) failure to report, and (iii) illegal gear or gear used illegally. Collectively, they accounted for 341 of the Unit's 493 violations, representing 69% of the total number of violations during the three-year period. Unit 3's dominant violation types included (i) illegal buy/sell/possess, (ii) registration/licence, and (iii) species/size limit totalling 273 violations out of a total of 418, or 65% of the total over the three-year period. Unit 4's top three violation types were (i) area/time, (ii) illegal buy/sell/possess, and (iii) illegal gear or gear used illegally totalling 138 out of 175 total violations or 79%.

Analysis of Enforcement Outcomes

The following table represents the Court outcomes of the violations for all three Units for each of the three years in question. (Source: DFO's DVS as of April 14, 2014).

Table 67. Summary of Decisions by Type per Year⁹⁶.

Decision Type	2011	2012	2013	Total
Absolute Discharge	0	0	1	1
Acquitted	6	3	1	10
Convicted	142	69	31	242
Dismissed	3	1	1	5
Withdrawn	6	2	4	12
Withdrawn/Plea Bargain	14	10	7	31
Total	171	85	45	301

One means of assessing the effectiveness of an agency's enforcement program when legal proceedings are initiated is to calculate its' successful prosecution level. In so doing, it is reasonable to exclude charges that are subsequently withdrawn or withdrawn due to a plea bargain since the Court would not have heard evidence upon which to render a verdict. The remaining data result in successful prosecution rates of 94%, 95% and 91% for 2011, 2012 and 2013 respectively. These high levels speak to the training, experience and professionalism of the Fishery Officers who enforce the lobster fishery's management measures and regulations and equally to those in the legal profession who prosecute violators.

The Assessment Team sought enforcement and compliance data from DFO with specified fields and table configurations, such as in relation to the monetary values of seized and forfeited goods, and licence suspensions. The team was informed that it was more practical to reproduce standard reports rather than adhoc ones as the latter are outside the standard realm of analysis and reporting. Data were made available on the number and value of monetary fines imposed by the Court and these are presented in the following table.

Table 68. Number and Corresponding Total Value of Fines Issued by Court for Units 2, 3, and 4.

Unit of Certification	2011		2012		2013 ⁹⁷		Totals	
	No. Fines	Total Fines (\$)	No. Fines	Total Fines (\$)	No. Fines	Total Fines (\$)	No. Fines	Total Fines (\$)
2	67	117,385.	26	77,135.	13	24,603.	106	219,123.
3	66	110,050.	34	53,950.	13	66,550.	113	230,550.
4	6	15,230.	2	8,100.	2	2,650.	10	25,980.
Totals	139	242,665.	62	139,185	28	93,803	229	475,653.

The Assessment Team is of the view that the monitoring, control and surveillance program in place in Units of Certification 2, 3 and 4 is multi-faceted, and effectively planned and delivered to enforce relevant management measures and rules within the financial constraints of program resources. There is evidence that the vast majority of lobster fish harvesters comply with the management system and are supportive of DFO's efforts which includes collaborating with C&P on a number of shared stewardship initiatives.

⁹⁶ Data provided by DFO is not LFA specific, and includes LFA 41 (offshore lobster fishery).

⁹⁷ Data for 2013 is preliminary.

4.5.8 Research Plan

Numerous research initiatives are conducted which contribute to the information needs of management and to the requirements associated with MSC Principles 1 and 2 in respect of all 4 Units of Certification. These initiatives provide timely and reliable information that is used to ascertain the overall health of the resource, understand ecosystem interactions, and contribute to the development of integrated fishery management plans to ensure that conservation and sustainability objectives are achieved. Industry representatives contribute to the research priority-setting process through both the management and science advisory processes, and by their participation in multi-group networking meetings.

Fishery Research Activities – Unit of Certification 1

DFO conducts the following research activities, the results of which are used in the formal assessment and ongoing monitoring of the southern Gulf's lobster population. Research findings are peer-reviewed and published on DFO's CSAS website.

- An annual multi-species trawl survey
- An annual SCUBA survey
- Voluntary experimental trap program to compare the performance of modified (no escape mechanism) and commercial traps
- At sea sampling program to gather information regarding commercial trap catch
- Larval collectors to provide lobster bottom settlement information
- Implementation of a work plan for compliance of precautionary approach management measures, and
- Oceanographic and atmospheric data collection

The annual trawl and SCUBA surveys, the experimental trap program, and the at-sea sampling and larval collector programs provide information on distribution, abundance, size, sex composition and age structure of lobster. Information is also collected regarding other species captured including shellfish, groundfish, pelagics, invertebrates, corals, sponges, etc.

Supporting the IFMP for the Lobster Fishery

Undertakings to collect additional information regarding the spatial extent of the fishery, habitat and ecosystem information and stock health reflect the expanded priorities under the proposed Precautionary Approach model for the lobster fishery of the southern Gulf. Current and proposed studies, as outlined in the approved IFMP, include:

- Collectors to evaluate lobster settlement and the biodiversity of species settling in the coastal habitat
- Effect of exposure to environmental contaminants on juvenile lobster
- Lobster landing and effort monitoring project using an electronic data logger
- Ecosystem processes in the Northumberland Strait
- Impact of scallop harvesting activities on coastal habitats and associated species

- Study on lobster benthic stages and habitat mapping
- Internal organ pathology associated to lobster shell disease
- Variability in trap catches from at-sea sampling during a spring fishery, and
- Protecting window-size female lobster to increase egg production

Precautionary Approach Model for Lobster Fisheries of Atlantic Canada

A workshop⁹⁸ conducted in 2010 brought together a national body of scientists to discuss possible indicators for data poor fisheries that could be used to meet national PA requirements. The workshop was the first opportunity for scientists involved in Atlantic lobster to discuss the scientific requirements of a precautionary approach for data poor fisheries. One of the largest benefits of the workshop was providing a forum of discussion on the important issues associated with the sustainable management of data poor fisheries.

A common theme in the discussion was the need to develop an assessment framework, which accepts data at different levels of availability. This would create a more transparent transition between ‘data based’ and ‘model based’ assessments and thus PA frameworks. The traffic light method (TLM) was seen as providing such a framework in that it accepts a wide suite of potential indicators. Some of these would be linked to the two axis of the PA framework and thus linked to a toolbox of regulations while others would be trigger indicators, which are signposts of caution while still others are indicators of the ecosystem.

Regardless of what indicators are used, participants noted that there needs to be a validation process to select the indicators. This could include full descriptions of the indicators, along with potential reference point boundaries, biological rationale and associated uncertainties. There is also a need for criteria on indicator selection based upon their statistical properties (e.g. signal to noise ratio). This could include examination of the relationship amongst aggregate groups of indicators (e.g. abundance versus removal rate indicators) to assist identification of the set of indicators most descriptive of stock dynamics.

As noted previously, DFO Gulf Region has now developed a peer-reviewed precautionary approach model that encompasses all of the LFAs of the SGSL. The model is expected to be published on the CSAS website in the very near future. Further work is required in the development of biological reference points and in the design and implementation of appropriate harvest control rules for these fisheries.

⁹⁸ http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/pro-cr/2010/2010_051_b.pdf

Table 69. Proposals for Potential Indicators and Reference Points⁹⁹.

Stock	Potential Indicator	Potential Reference Points	Gaps & Uncertainties
Pacific Dungeness Crab	Landings	LRP: 0.4 * central tendency USR: 0.8 * central tendency	Lack of reliable data, changes in effort
	CPUE (at fishery opening)	LRP: 0.4 * central tendency USR: 0.8 * central tendency	Reliability of CPUE as an index of abundance, length of time series
	CPUE-depletion estimator		
Maritimes Lobster	Landings	Percentiles e.g. 80, 50, 30	"correct" period; changing effort; earlier landings underreporting
	CPUE (legal sizes) from standard traps	Percentiles e.g. 80, 50, 30	
	CPUE (legal sizes) from logs	Percentiles e.g. 80, 50, 30	
	CPUE (pre-recruits) from standard traps	Percentiles e.g. 80, 50, 30	
Gulf Lobster	CPUE (ovig spawners) from standard traps	Percentiles e.g. 80, 50, 30	
	Landings		Data timeliness (unreported data), data reliability, reference period, area
	Survey Index		Coverage (\$; catchability), time series
	CPUE (pre-recruit)		
	CPUE (berried females)		Coverage (voluntary program; data quantity & reliability), time series
Quebec Lobster	Survey (young)juvenile Index		Coverage (\$)
	Landings	LRP: 0.4 * median USR: 0.8 * median	Impact of increase in MLS and reduction of fishing effort; quality of landings reporting
	CPUE (legal sizes)	LRP: 0.4 * median USR: 0.8 * median	Impact of increase in MLS and reduction of fishing effort - consequent changes in catchability; data based on at-sea sampling (only 0.14 % of coverage)
	Survey (trawl) index for different components of population		Trawl selectivity; spatially limited
	Size (mean or median); Index of healthy demographic structure; Index of removal rate; Index of reproductive capacity when compared to size at sexual maturity	LRP: mean / median size before increase in minimum legal size USR: mean or median size where 2nd molt class=0.5 * 1st molt class	Changes in gear selectivity; management measures (ex. Closed window); recruitment pulse. This indicator does not inform on abundance. Could not be used alone.
	Sex ratio : Index of equilibrated demography, Index of operational reproductive capacity	LRP: ratio M:F e.g. 1:1	Differential catchability - sex
	CPUE (berried Females); Index of reproductive potential	LRP: median before increase in MLS ; proportion of 0.125 (1 female out of 2 produce eggs) USR: median since increase in MLS ; proportion of 0.25 (all females produce eggs every 2nd year)	Catchability and fishing strategy (avoidance of berried females by fishers); data based on at-sea sampling (only 0.14 % of coverage)- representativity ?
	CPUE (multiparous females)		
Nfld & Labrador Lobster	Index of egg production		
Nfld & Labrador Lobster	Landings	LRP: historical low	Period to use; data accuracy; changes in effort over time

⁹⁹ http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/pro-cr/2010/2010_051_b.pdf

Table 70. Proposals for Potential Indicators and Reference Points for removal Reference¹⁰⁰.

Stock	Potential Indicator	Potential Removal Reference	Gaps & Uncertainties
Pacific Dungeness Crab	Legal/discard index ratio from Instar model		Uncertainty around M estimate
	CPUE ratio		Reliability of CPUE as an index of abundance
	Discard rate		Handling mortality
Maritimes Lobster	Change-in-ratio	Historical maximum	limited to certain size groups, limited time period, q variation
	Length composition analysis	Historical maximum	recruitment variation; assumption of no change in M at size; q changes
	% in 1st molt group	Historical maximum	q changes
	Eggs per Recruit (EPR)	Doubling	
Gulf Lobster	CPUE (weekly)		Coverage (2012) - voluntary program (data quantity & reliability); length of time series
	First molt group		Coverage - voluntary program (data quantity & reliability); length of time series
	Incidence of empty traps		Coverage - voluntary program (data quantity & reliability); length of time series
	Change-in-ratio		Highly biased (overestimation); q issue
Quebec Lobster	Exploitation rate (fishable component)	RRP: 90th percentile of 1985-2008 - period of sustained production	F estimate Influenced by q
	Exploitation rate (population ≈ 76 mm CL)	RRP: mean before increase in MLS TARGET : F for optimal YPR	changes in escape vents - selectivity of traps affect proportion of prerecruits & estimation

Research in support of Ecologically and Biologically Significant Areas (EBSAs) – Gulf of St. Lawrence¹⁰¹

The Northumberland Strait encompasses entirely or in part four (4) Ecologically and Biologically Significant Areas (EBSAs) identified in the Gulf of St. Lawrence Integrated Management Initiative (GOSLIM). While DFO has established standards to identify EBSAs (2004, 2011) and EBSAs have been identified for the Gulf of St. Lawrence (2007), work is ongoing both in coastal zones in regard to ecologically important species and biological habitats, and in the nearshore area for species like lobster.

The focus of the project's work is primarily directed at mapping species' distributions and identifying important habitats in the coastal and nearshore zones. The objective of the project is to develop tools to provide scientific support for management to prioritize habitat protection and identify EBSAs in coastal and nearshore areas. The current project continues work started in 2012-2013 within the DFO Quebec Region, expanding the modelling to predict species occurrences to include the Gulf Region (all of the southern Gulf of St. Lawrence). The tools will consist of geo-referenced databases of (i) species abundances and occurrences, (ii) habitat descriptors of coastal and nearshore areas, and (iii) predictive maps of species distributions and concentrations in these areas. The resulting mapping outcomes can then be used to identify potential EBSAs based on both the environmental and biological components of ecosystems.

The project's intended deliverables include:

- Completion of a geospatial database of the known distribution of the main species in the Gulf of St. Lawrence;
- Production of expected species distribution maps over the entire region based on environmental parameters and known distributions;
- Present results and provide advice on EBSAs in the coastal zone through a CSAS RAP (early spring 2014);
- Science advice on EBSAs in the coastal waters of the Gulf of St. Lawrence; and
- Publication of a technical report to provide the scientific basis for the identification of

¹⁰⁰ http://www.dfo-mpo.gc.ca/CSAS/Csas/publications/pro-cr/2010/2010_051_b.pdf

¹⁰¹ The information reported in this section was drawn from a detailed project report provided to the assessment team by DFO Gulf Region.

particularly important coastal habitats and for the determination of EBSAs in the coastal zone.

Ecosystem Research Initiative – Northumberland Strait

In 2007, DFO committed to develop ecosystem-based approaches to managing human interactions with marine systems. This commitment resulted from Canada's *Oceans Act* and recommendations from international bodies such as the Food and Agriculture Organization of the United Nations. To develop such approaches, seven Ecosystem Research Initiatives (ERIs) were established by DFO Science as pilot projects to enhance the capacity to provide scientific advice in support of ecosystem-based management (EAM).¹⁰² The over-arching themes of the ERI program were to (i) understand ecosystem processes, (ii) understand the impacts of environmental and climate variability, and (iii) develop tools for science support of a departmental EAM. ERIs were wrapped up in 2012 and a national science advisory process was convened in November 2012 to discuss various aspects of the ERI program.¹⁰³

The published proceedings reported that the ERIs provide the opportunity to learn valuable lessons with respect to the design, coordination and implementation of complex science programming at the ecosystem scale in support of DFO's ecosystem approach to management. Key conclusions and advice from the ERIs included (i) the need for multi-sector cooperation at regional and national levels to identify priorities for Science to support management and policy, (ii) the need for new tools to assess cumulative impacts, and (iii) the improvement of comprehensive ecosystem-level monitoring, assessment and predictive capabilities.

Achievements and outcomes for the Northumberland Strait ERI were reported in a DFO Gulf report dated November 8, 2012 (hard copy provided to the assessment team) following a meeting of stakeholders on October 24, 2012. Of note, DFO reported that a number of new and successful partnerships were established in delivering the numerous research, monitoring activities and programs linked to the ERI program. A sample of the research results reported by the department includes:

- Field and laboratory work in support of the assessment of habitat and benthic organism changes in the past 30 years was completed, with analysis and report writing to be completed.
- Databases generated by the research activities have been structured and access is now available.
- Survey biomasses (and sizes) available for most major components.
- Representative diets identified for most components.
- Major effort made to obtain abundance estimates and feeding data for rock crab, including an assessment of the ecological role of rock crab versus that of lobster.
- Quantification of the makeup and location of fish species assemblages extended in time and space.

In 2012, DFO initiated its Strategic Program for Ecosystem-Based Research and Advice (SPERA)¹⁰⁴ as a replacement for the ERI program. SPERA will continue to provide a science-based foundation for management and decision-making related to the larger departmental move toward EAM. Research needs are identified by an advisory committee comprise of DFO representatives from the Science,

¹⁰² http://www.dfo-mpo.gc.ca/science/oceanography-oceanographie/accasp/eco_research-eng.html

¹⁰³ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2013/2013_027-eng.pdf

¹⁰⁴ <http://www.dfo-mpo.gc.ca/science/ecosystem/projects/index-eng.html>

Management and Policy Sectors. SPERA's work will be grouped under three main themes: (i) quantifying ecosystem impacts of human activities, (ii) assessing and reporting on ecosystems, and (iii) developing tools for an EAM.

Collaborative Research (in respect of all 4 Units of Certification)

Commitment to collaborative research initiatives is demonstrated by the establishment and ongoing activities by a number of scientific organizations.

A. **Canadian Fisheries Research Network**¹⁰⁵. The Network was established to focus on issues of direct relevance to industry, and is aimed at increasing knowledge that will enhance the ecological sustainability, socio-economic viability and management of Canadian fisheries. The research objectives of the Network include:

- Overcome information gaps for important commercial fisheries and improve the use of industry information in assessment and management.
- Enhance ecological sustainability while achieving operational efficiency.
- Improve the basis for the ecosystem approach to fisheries management.

Canadian Fisheries
Research Network



Réseau canadien de
recherche sur la pêche

Within the Network is a 'lobster node' which provides research activities in collaboration with industry, DFO, provincial departments of fisheries and other institutions. The projects currently underway include:

Enhanced fisheries knowledge: This research will help identify the knowledge requirements of the emerging Ecosystem Approach to Management and Integrated Management approaches that will place more emphasis on a broader view of sustainability, prepare Canadian fisheries to be more sustainable, and prepare stakeholders to participate effectively in the emerging fisheries management regimes.

Lobster metapopulation dynamics: The overarching goal of this project is to advance the understanding of stock structure of the American lobster in Atlantic Canada and how local populations of lobster are connected via the movement of larvae and adults (connectivity). The Network is undertaking five integrated research activities:

- (i) Measuring the abundance, size and quality of egg-bearing females caught by fishermen at 50-75 km intervals along the coastline to assess the input of larvae into the marine environment.
- (ii) Using a model to predict the distribution and settlement of these larvae.
- (iii) Studying larval settlement behaviour to inform the model.
- (iv) Using tagging studies to assess the importance of bottom movements to connectivity, and
- (v) Developing large quantities of genetic markers to refine our understanding of lobster population genetics.

Factors influencing recruitment and survival: This research project will study the effect of water temperature, bottom type and how young lobsters react in the presence of predators.

¹⁰⁵ <http://www.cfrn-rcrn.ca/Public-Overview-EN>



B. **Atlantic Lobster Sustainability Foundation**¹⁰⁶ also conducts research projects contributing important findings regarding:

- Effects of contaminants on lobster population
- Larval transport and settlement
- Lobster movement
- Stock modeling, and
- Lobster culture and seeding

C. **Canada Water Network's**¹⁰⁷ Northumberland Strait Environmental Monitoring Partnership (NorSt-EMP), a partnership of government, industry and non-governmental organizations, was formed in 2011 to address the need for a monitoring framework to support cumulative effects assessment in the region. The highest priority concerns for monitoring are the influx of sediments, contaminants and nutrients from land-based activities that degrade the rivers, estuaries and the coastal regions of the Strait. The priority valued ecosystem components identified were the region's estuarine biota, particularly its submerged aquatic plants, invertebrates and fish — all of which directly or indirectly support coastal fisheries, aquaculture, tourism and recreation in the Strait.

Research will be focused on the following activities:

- Advancing methods to quantify land-based stressors, primarily the influx of nutrients and sediment into the Strait. This research is critical, as it establishes the link between estuarine biological monitoring and activities on land so watershed managers can make informed decisions.
- Developing monitoring tools to restore and maintain estuarine integrity. To facilitate a legacy of integrated monitoring, it is essential that the monitoring tools being developed be sensitive to environmental parameters in the chosen estuaries, be feasible both temporally and spatially, and be economically realistic, and
- Advancing cumulative effects assessments in the Strait by developing stressor-based models of estuarine impacts. This component will integrate all components of the project by developing predictive models to support decisions of end users.



Ultimately, the research will:

- Quantify the loading of nutrients and sediments into the Northumberland Strait and develop biological monitors of them.
- Identify indicators of estuarine health, particularly the fish, invertebrates and plants in the Strait that underpin the ecosystem's health, and

¹⁰⁶ <http://www.lobstersustainability.ca/what-we-have-done.php>

¹⁰⁷ <http://www.cwn-rce.ca/initiatives/canadian-watershed-research-consortium/watersheds-projects/dr.-michael-van-den-heuvel>

- Combine the two previous outcomes to create predicitive models that link land-based sediments and nutrients to cumulative effects on submerged aquatic plants, fish and invertebrates in the estuaries and bays of the NorSt-EMP monitoring region.

D. Lobster Science Centre (AVCLSC) is a research centre within the Atlantic Veterinary College at the University of Prince Edward Island¹⁰⁸, dedicated to conducting fundamental and applied research in crustacean health. The AVCLSC research is focused on the application of the principles of veterinary medicine to the regional crustacean fisheries (lobster, snow crab and shrimp). Research projects involve the training of highly qualified personnel in graduate studies in all aspects of crustacean health. Potential commercial applications include development of therapeutants and diagnostic tools. The overall goal of our research focus is towards improving the knowledge on different crustacean species for the sustainability of the crustacean sector of the Canadian seafood industry.

The benefits of the AVC Lobster Science Centre include:

- Enhance levels of return to the Canadian lobster and crustacean industries through research on the health of crustaceans in the wild and in handling, holding and transportation facilities.
- Develop a knowledge base that will lead to innovative methods and technologies which can be transferred to crustacean fisheries (ocean to plate) for better marketing and planning decisions.
- Provide a research team dedicated to crustacean health.
- Train highly qualified personnel in crustacean health, and
- Enhanced capacity for crustacean health research and development will lead to longer term and more innovative programs for the lobster industry through the AVC Lobster Science Centre.



Current Lobster Research Projects include:

- Immune response to pathogen
- Larval Moult and Development
- Moult Recovery
- Reproductive Status
- Impact of pesticides & environmental contaminants
- Chain of custody study – Location, live holding and shipping
- Lobster Welfare and Humane Treatment
- Completed Lobster Research Projects include:
- Infectious disease & host response in American lobsters.

¹⁰⁸ <http://projects.upei.ca/lobsterscience/>

- Potential Significance of the Disease “Paramoebiasis” to Canadian Lobsters, and
- Lobsternet: A Web-based Lobster Research Database

Environmental and Ecological Research: DFO coordinates much of the data collection and analysis of the Atlantic Ocean research in Canada that is summarized through their scientific data and products portal¹⁰⁹. This information includes biological, chemical, physical and meteorological data. There are also several climatic data sets collected on a regular basis, including:

- **Remote Sensing:** The Bedford Institute of Oceanography¹¹⁰ (BIO) and the Maurice Lamontagne Institute provide high-resolution spatial and temporal imaging of Sea Surface Temperature.
- **Remote sensing of chlorophyll and phytoplankton:** BIO also provides analyses of ocean color that can be used as a proxy for chlorophyll a concentration and phytoplankton biomass. BIO analyses have provided a means of monitoring the timing, magnitude, and duration of the production cycle across the Northwest Atlantic.
- **Satellite Altimetry:** Dr. Guoqi Han of the NL Region Biological and Physical Oceanography Section within DFO–NL Region makes use of satellite altimetry to model the speed and path of water currents such as the Labrador Current.
- **Atmospheric Data:** Environment Canada collects sea level pressure, dew point, temperature, dry bulb temperature, wind speed, wind direction, total cloud cover, rainfall and solar radiation data, on an hourly basis, at a number of fixed meteorological stations along the east coast of Canada from southern Nova Scotia to Elsmere Island in the north.
- **Climatic datasets:** Combined with data collected from multi-species research vessel surveys, standard oceanographic transect surveys conducted annually and high-resolution vertical profiles of standard variables (temperature, salinity, dissolved oxygen and fluorescence) are collected at each station. Water samples, collected by Niskin bottles at fixed depths, are analysed for *in situ* measures of nutrients and chlorophyll.

E. **Industry Fish Harvester Organizations** also contribute to the body of research in specific areas of the Gulf Region under the aegis of DFO Science-based protocols.

- The Gulf Nova Scotia Fishermen’s Coalition partnered with two universities, the Province of Nova Scotia, a lobster researcher and DFO to undertake a comprehensive two-year lobster science project in 2012 and 2013. Its main objectives were to: (i) collect information on population dynamics, (ii) determine the number of egg-bearing and non-egg bearing females including the health of egg clutches to make future predictions regarding lobster productivity and reproductive health, (iii) provide an economic/biological benefits analysis of the affects of an increase in the minimum carapace length, and (iv) improve harvesters’ understandings of the many aspects associated with the lobster resource.
- The Gulf Nova Scotia Bonafide Fishermen’s Organization partnered with the Gulf Nova Scotia Fisheries Collaborative Research Society to carry out a comprehensive lobster tagging

¹⁰⁹ <http://www.dfo-mpo.gc.ca/science/data-donnees/index-eng.html?sub=temp>

¹¹⁰ <http://www.bio.gc.ca/science/newtech-technouvelles/sensing-teledetection/index-eng.php>

project from a number of locations in 26A-2 in 2012 and 2013 to ascertain the migration pattern of lobster and to map recapture and release sites. Future plans include underwater filming to study how lobster responds to different types of bait.

Comprehensive Reporting (in respect of all 4 Units of certification)

There is an interactive and consistent exchange of information between both federal and provincial fisheries representatives, scientific staff and institutions, and lobster industry stakeholders. Both DFO Management and Science staff provide regular explanations and feedback on recommendations made by industry as indicated by management measure announcements¹¹¹. The documents that are produced are available on the CSAS website and are also explained to, and discussed with, industry and others at management advisory and science assessment committee meetings, special workshops, and industry association annual meetings.

The information dissemination process is comprehensive, providing engagement, feedback to stakeholders, and demonstrating that relevant information is provided to stakeholders on a regular and timely manner.

Fishery Research Activities – Units of Certification 2, 3 and 4

A. **DFO Maritimes Region** conducts a wide range of research activities, the results of which are used in the formal assessment and ongoing monitoring of the region's lobster populations, and habitat and ecosystem interactions in LFAs 27 to 38. Collectively, the body of research initiatives, including collaborative research conducted by other institutions and fish harvesters, provide the management system with reliable and timely information that informs the development of measures and policies consistent with MSC Principles 1 and 2. Industry contributes to the elaboration of DFO Maritimes' research priorities through both the management and science advisory processes. Research findings are peer-reviewed and published on DFO's CSAS website.

DFO conducts the following research activities in support of both its ongoing lobster stock assessment program and as identified at Section 2.6 of the Maritimes Region's Integrated Fishery Management Plan. Some of the activities are co-partnered with industry as discussed in a later section of the report.

- An annual Trawl Survey
- Lobster Recruitment Index Project
- Commercial Trap Sampling Program to compare commercial trap catch with science traps
- At-sea sampling program to gather information regarding commercial trap catch
- Lobster settlement to provide lobster bottom settlement information
- Lobster size at maturity to help assess the size at which 50% of lobsters mature
- Implementation of a work plan for compliance of precautionary approach management measures
- Oceanographic and atmospheric data collection

The **Trawl Survey** along with experimental trap and at-sea sampling programs provide information on distribution, abundance, size, sex composition and age structure of lobster. Information is also collected on other species captured including shellfish, groundfish, pelagics, invertebrates, corals,

¹¹¹ <http://www.dfo-mpo.gc.ca/decisions/fm-2013-gp/atl-009-eng.htm>

sponges. The survey is a source of fishery independent information on lobster. Originally designed for groundfish, these surveys collect a wide variety of other species and are now considered ecosystem surveys. The surveys have been conducted since 1970 and follow a stratified random design defined by 50, 100 and 200 fathom depths. Trawl locations within each stratum are selected randomly prior to the survey.

Size at maturity: The goal is to update estimates for this key biological parameter affecting egg production. Sampling and analysis are underway for eastern LFAs (27-31a) and in LFA 33.

Lobster settlement strength and distribution: The goal is to determine whether settlement numbers provide an indicator of year class strength, and to evaluate geographic differences in the numbers of settlers. Tools include settlement collectors and SCUBA (suction sampling). This is a joint project with FSRS.

Lobster molt and quality study: The goal is to understand variations in lobster quality in relation to moult condition

Fishery independent indicators of lobster abundance: The goal is to provide indicators of abundance that are independent of the trap fishery. Activities include pilot surveys for lobster abundance using video as well as analysis of data on lobster abundance collected during other surveys such as the annual ecosystem Maritimes Region Research Vessel Trawl Survey, and surveys directed at scallops.

B. Research in support of the Precautionary Approach for the Inshore Lobster Stocks

As noted in the previous section for Unit 1, a workshop conducted in 2010 brought together a national body of scientists to discuss possible indicators for data poor fisheries that could be used to meet national PA requirements. Research published¹¹² in 2012 examined the development of reference points for the inshore lobster stocks in LFAs 27-38. While the median of the lobster landings from 1985-2009 was used as a B_{MSY} proxy, there were still uncertainties and caveats associated with the use of landings data as a proxy. Therefore, it was recommended that the proposed Reference Points should only be used with additional reference to secondary indicators.

This document left a list of future work to be completed, including¹¹³:

- Further exploration of data from trawl surveys to better assess stock status
- Improve CUPE models
- Explore University of Maine models
- Develop an alternative to landings as the sole proxy
- Evaluate how indicators from adjacent management units can be incorporated.
- Develop indicators that would signal a change in production
- Develop indicators of lobster health and condition
- Evaluate the rate of mating success, interaction with sex ratio and effect on egg production

¹¹² http://www.dfo-mpo.gc.ca/Csas-sccs/publications/resdocs-docrech/2012/2012_028-eng.pdf

¹¹³ Some of this work has been addressed such as for Units of Certification 3 and 4 (Tremblay et al. 2013 and associated SARs).

C. Research in support of Ecosystem Approach to Management (EAM) and Ecologically and Biologically Significant Areas (EBSA)

Ongoing research by DFO with important contributions from its partners, discussions with Industry representatives and independent studies have contributed substantially to improving the knowledge and understanding of ecosystem-based management needs for the lobster fisheries and dependent habitat and ecosystem interactions. Examples of recent research include:

- MacLean M, Breeze H, Walmsley J and Corkum J (eds). 2013. *Marine Habitats and Communities - State of the Scotian Shelf Report*. Can.Tech.Rep.Fish.Aquat.Sci. 3074;
- Horsman T, Serdynska A, Zwanenburg, K, and Shackell, N. 2011. *Report on Marine Protected Area Network Analysis for the Maritimes Region of Canada*. Can.Tech.Rep.Fish.Aquat.Sci. 2917;
- Horsman T and Shackell N. 2009. *Atlas of Important Habitat for Key Species of the Scotian Shelf, Canada*. Can.Tech.Rep.Fish.Aquat.Sci. 2835;
- Fader, G. *Classification of Bathymetric Features of the Scotian Shelf*. Atlantic Marine Geological Consulting Ltd. (undated);
- Hebert D, Pettipas R, Brickman D and Dever M. 2013. *Meteorological, Sea Ice and Physical Oceanographic Conditions on the Scotian Shelf and in the Gulf of Maine during 2012*. Canadian Science Advisory Secretariat – Research Document 2013/058; and
- Worcester T and Parker M. 2010. *Ecosystem Status and Trends Report for the Gulf of Maine and Scotian Shelf*. Canadian Science Advisory Secretariat – Research Document 2010/070.
- Araújo, J.N. and Bundy A. 2011. *Description of three ecosystem models of the Bay of Fundy, Western Scotian Shelf and NAFO Division 4X*. Can. Tech. Rep. Fish. Aquat. Sci. 2952: xii + 189 pp.
- Araújo, J.N., and Bundy A. 2012. *The relative importance of environmental change, exploitation and trophodynamic control in determining ecosystem dynamics on the western Scotian Shelf, Canada*. Mar. Ecol. Prog. Ser., 464:51–67.

DFO's Strategic Program for Ecosystem-Based Research and Advice (SPERA) will continue to provide a science-based foundation for management and decision-making related to the larger departmental move toward EAM. Research needs are identified by an advisory committee comprise of DFO representatives from the Science, Management and Policy Sectors. SPERA's work will be grouped under three main themes: (i) quantifying ecosystem impacts of human activities, (ii) assessing and reporting on ecosystems, and (iii) developing tools for an EAM. Selective projects that have been approved include:

1. Project: Evaluation of the potential for seismic surveys to impact lobster resources (Newfoundland and Labrador)

Description: A previous study showed that the sound from an air gun used in seismic surveys caused changes in lobster tissues and potential organ damage one day after being exposed. However, there can be a delay in the expression of tissue damage after lobsters are exposed, and it is necessary to determine if more substantial effects appear after several days. This project will further examine lobsters exposed to air gun sound seismic surveys.

2. Project: Exploration of approaches to assess cumulative impacts of activities in the coastal zone within an Ecosystem Approach to Management Framework (EAM) (Maritimes)

Description: This project aims to support the advancement of an EAM in the Maritimes by defining a method to assess the impacts of human activities on coastal regions within an EAM context. A regional workshop will focus on furthering the implementation of this approach and determining how best to provide scientific advice on the impacts of human activities. This project will also compile available examples of habitat and resource maps, and information on zones of human activity, to assess the usefulness of mapping and modeling tools.

3. Project: An integrated approach for the identification of biologically important regions and the production of ecosystem indicators in the Gulf of the St. Lawrence (Gulf of St. Lawrence)

Description: Evaluating and reporting on ecosystem status, and producing tools for ecosystem-based management are two key themes of the SPERA program. This project will use historical data collected from 2006 to 2009 in the north and south of the Gulf of St. Lawrence to create a database that describes how different organisms are distributed, including invertebrates, zooplankton, pelagic fish (species that live neither near the bottom or the shore), and demersal (or bottom-feeding) fish. The project will also establish biodiversity indicators, and the resulting database will be used to identify areas of biological interest. The data will be integrated into the existing geographically referenced database, Fish Habitat Management Information System (FHMIS). Data on marine mammals will eventually be collected and added to the database, and the area of study will be extended to the Scotian Shelf and the Bay of Fundy.

4. Project: Biodiversity measures for use in the Ecosystem Approach to Oceans management (Maritimes, Canada-wide)

Description: Meeting Canada's commitment under the Convention on Biological Diversity requires that DFO be able to measure and report on the level of biodiversity in marine and freshwater ecosystems. This project will evaluate international information on biodiversity indicators, with a focus on their application to Canadian waters. It will lead to a technical report providing detailed recommendations for consistent and scientifically sound reporting of biodiversity.

5. Project: Ecosystem indicators for ecosystem monitoring at different scales (Maritimes)

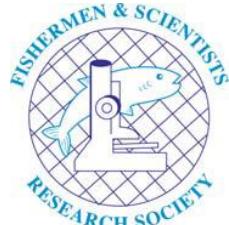
Description: Progress on EAM requires evaluation and selection of useful indicators of ecosystem status that can provide an assessment of past and current effects of fishing on ecosystems to ocean and fisheries managers. This project will enhance the ability of Fisheries and Oceans Canada to move ahead with an EAM. It will review the current use of ecosystem indicators and their effectiveness, select and evaluate a series of indicators to assess their utility for DFO, use these indicators to assess the status of the western Scotian Shelf, and to determine whether they are useful to assess the effectiveness of closed areas, such as protected and conservation areas.

6. Project: Identification of benthic Ecologically and Biologically Significant Areas (EBSAs) on the Scotian Shelf (Maritimes)

Description: Ecologically and Biologically Significant Areas (EBSAs) are identified and prioritized using criteria that include uniqueness/rarity and aggregation of an area compared to other areas; how the loss of an area would compromise a population; how natural or undisturbed the habitat is; and the area's resilience to physical disturbance. Prior to this project, there has not been a systematic review of species and habitats in benthic marine areas (the lowest region of a body of water) in Maritimes Region for the purpose of identifying EBSAs. This project will apply the above criteria to identify EBSAs in the Scotian Shelf using data on benthic species and habitats.

D. Collaborative Research

The **Fishermen and Scientists Research Society (FSRS)**, a non-profit charitable organization first established in 1994, exists to promote the long term sustainability of the marine fisheries resources through an active partnership between fishermen and scientists. The objective of this partnership is to establish and maintain a network of fishermen and scientific personnel that are concerned with the long-term sustainability of the marine fishing industry in the Atlantic Region.



The Society's objectives are to promote effective communication and common goals between fishermen, scientists and the general public; and facilitate collaborative research and the collection of relevant information that promotes the conservation of North Atlantic fisheries stocks.

The partnership is promoted by:

- fishermen actively participating in fisheries research, improving the process by making available to scientists information that only fishermen can obtain on a daily basis;
- encouraging communication between FSRS members and networking to increase knowledge and interest in the activities and research throughout the fisheries community; and
- fishermen participating in the development of a sound information base which contributes to more effective resource management and conservation.

The Society's current projects are summarized in the following table:

Table 71. Fishermen and Scientists Research Society's Current Lobster Project.

Project Title	Coverage and Year	Comments
Lobster Recruitment Index Project	LFAs 27-35: 1999 to present. Data is provided to DFO Science and incorporated into the stock assessment and peer review processes.	Monitoring trends in recruitment catches in standardized science traps. Fishermen collect all data themselves and also deploy a temperature logger to record bottom temperatures in their
LFA 33 Commercial Trap Sampling Project	LFA 33: 2003 to present.	Fishermen sample out of 3 of their commercial traps for comparison to the science traps.
At-Sea and Shore-based lobster sampling Project	All LFAs covered: ongoing. Data collected includes size composition of commercial landings (at port), sex and berried, shell hardness, crab bycatch. At-sea sampling data are incorporated into DFO's assessments for the stock.	Areas covered vary depending on funding available for technicians.
Atlantic Lobster Moult and Quality Project	LFAs 33 -35:2004 to present	Analyses of blood protein, shell hardness and moult staging are performed on 125 lobsters and quality of lobsters is monitored.

Lobster Settlement Project	LFAs 27,31 -34: 2006 to present	Monitoring the young of the year lobsters in various areas in collaboration with DFO
Lobster Size at Maturity Project	LFAs 31B, 32, 33 and 34: 2010 to present Data collected are used by DFO in their stock assessments.	Helping to assess the size at which 50% of lobsters reach maturity in collaboration with DFO.
CFRN Lobster Node Project	LFAs 27-35: 2011 to present Part of a Maritimes-wide project that is looking at relationship between larval drift, size of females, egg stage, clutch size and condition.	Helping to track berried females-collaboration with UNBSJ.

E. Industry Fish Harvester Organizations

The vast majority of fish harvester organizations in the Maritimes Region endorse and participate in a variety of lobster research projects. Some of the projects are regional in scope (spanning several LFAs) and overseen by organizations with broad research mandates; others are LFA-specific in response to the interests of local fish harvesters. Both types of projects add to a growing body of scientific and technical knowledge which serves to educate stakeholders and strengthen the fishery integrated management and planning systems. The following information is intended to highlight the lobster science work undertaken by some of these organizations.

The **Guysborough County Inshore Fishermen's Association** has been undertaking important lobster-related research activities since the 1990s. Documents provided to the assessment team included reports detailing the research activities undertaken and findings as well as a research plan for the period from 2002 to 2014. The primary focus of the Association's research is centered on three particular projects: (i) in-season at-sea sampling of lobster catches including larvae densities, condition of molt/protein levels, and monitoring of juvenile lobster abundance, age, and size of sexual maturity of females, (ii) lobster larval study and methodology, and (iii) out-of-sea juvenile trapping studies. The work is carried out by technicians and student interns with the collaboration of lobster fishers from various ports in LFA 31a and 31b.n LFA 31a and 31b.



The **Fundy North Fishermen's Association** is partnered with the NSERC Capture Fisheries Network to increase its understanding of lobster stocks in the Bay of Fundy. Fish harvesters work with scientists on the water to learn more about: the origin, abundance and quality of lobster larvae; the transport and distribution of larvae; the factors affecting settlement and survival of lobster to map the distribution of adequate lobster settlement grounds; the movement and activity of juvenile lobsters; the lobster population genetic structure; berried female data collection; a study of the effects of dredge spoil dumping on lobster in Saint John Harbour, a study on PSP levels in lobster, a local knowledge study (with UNB) on fishermen's knowledge of the impacts of salmon aquaculture on traditional fisheries including lobster.



Research Plan

While the assessment team members agreed that a wide range of pertinent research contributes to achieve the objectives consistent with MSC's Principles 1 and 2, they noted that MSC requires a written research plan (CB4.10.3), which does not exist.

3.3.9 Monitoring and Evaluation of the Lobster Management System

Unit of Certification 1

Section 10 of the IFMP for the Southern Gulf of St. Lawrence commercial lobster fishery describes the program review process for monitoring the lobster management system and evaluating its performance in relation to the IFMP's strategic objectives. Specific performance metrics, both qualitative and quantitative, are used for this purpose. Stakeholder input is accommodated via the regional Lobster Advisory Committee. Listed below are the elements of the lobster management system to be monitored along with their associated performance indicators.

Table 72. Evaluation of Management Objectives of the Lobster Management System and Performance Indicators.

Management Objectives	Performance Evaluation Indicators
Stock Conservation	<ul style="list-style-type: none">▪ Harvest control rules are developed that clearly define what actions are to be taken for a given stock status▪ Measurable reductions in exploitation rates to lower dependency on new recruits▪ Number of commercial licences retired▪ Percentage of unfished lobster reaching maturity▪ Catch/effort data are collected, analyzed and used in the management of the fishery
Ecosystem	<ul style="list-style-type: none">▪ Catches and mortality of non-targeted species is low to nil▪ Monitor the effectiveness of trap biodegradable panel
Stewardship	<ul style="list-style-type: none">▪ Industry establishes an integrated governance structure which includes fish harvesters and processors▪ Frequency and type of discussions that take place with and between stakeholders▪ Level of participation by stakeholders in the consultative process
Social and Economic	<ul style="list-style-type: none">▪ Prices paid to fish harvesters▪ A high quality product is landed and processed▪ Gluts on the market and in the processing plants are avoided▪ Number of harvesters does not increase
Compliance	<ul style="list-style-type: none">▪ Number of Fishery Officers hours▪ Number of violations

A number of internal and external mechanisms are in place and in use to monitor and evaluate the performance of the management system for the Eastern NB and Gulf Nova Scotia commercial

lobster fisheries. Key components of the management system and associated mechanisms are listed in this section.

Units of Certification 2, 3 and 4

The IFMP for the lobster fisheries of the Maritimes Region states that "It is crucial to effective management that there be evaluations of the performance of sector plans, or specific elements of them, to determine whether the rules and regulations that were employed are being effective and thus that the strategies in the overall plan are being adequately implemented in that sector." The general plan evaluation will determine whether:

- the plan identifies and addresses all the important impacts on the ecosystem;
- the strategies are doing their job in meeting the plan objectives; and
- the strategies are being implemented satisfactorily overall

Long-term objectives for the IFMP center on maintaining viability of the stock and existing fleet, promoting shared stewardship and optimizing benefits for participants and local communities. Evaluation criteria include:

- Collection of Catch and Effort information through monitoring documents;
- Dockside checks by DFO staff;
- Essential data to assess the health of the lobster stock collected and supplied to Science;
- Communications to Industry;
- Feedback from industry; and
- Overall adherence to the plan

The assessment team notes that the IFMP does not define what benchmarks will be relied upon to inform the aforementioned evaluation criteria. For example, it is unclear how the management authority would evaluate whether the objectives for 'optimizing benefits for participants and local communities' are performing satisfactorily? Absent any benchmarks (or performance targets), the extent to which the long-term objectives for the fisheries are performing as intended would be difficult to determine. The absence of related milestones only further complicates the evaluation process by leaving the timeframes open to interpretation.

Internal Mechanisms (Governmental and Industry Stakeholders) – in respect of all 4 Units of Certification

- Precautionary Approach: DFO Sustainability Checklist for the fishery (not available to assessment team);
- Stock Assessment: CSAS formal peer-review process;
- Ecosystem Interactions: Ongoing scientific and technical research; workshops; DFO's Sustainability Checklist for the fishery;
- Compliance and Enforcement: Post-season review involving various DFO regional program sectors; local lobster advisory committee; Enforcement Roundtables;
- Economic and Social: DFO Cost-Earning Studies;

- Fishery's Performance: Performance indicators as per the provisional IFMP (Unit of Certification 1 only);
- Management Measures: Post-season review involving various DFO regional program sectors; regional and local advisory committees; special government-industry roundtables; occasional study by Parliamentary Committee (SCOFO); and
- Departmental Fisheries Programs and Services: Program Evaluations and Audits (Ongoing).

External Mechanisms (Parliamentary Oversight, Ministerial Panels/Roundtables, Academia, Private Sector) in respect of all 4 Units of Certification

A number of formal external reviews or studies of the performance of various aspects of the Atlantic lobster fishery (or associated fisheries) have been undertaken over the course of the past two decades. They include:

- Fisheries Resources Conservation Council (1995 and 2007);
- Maritime Lobster Panel Report (2013);
- Independent Panel on Access and Allocation (2002);
- Atlantic Fisheries Policy Review (2004);
- Senate of Canada Standing Committee on Fisheries and Oceans (2012);
- House of Commons Committee on Fisheries and Oceans: Ongoing
- Lobster Council of Canada: Ongoing;
- Provincial Ministerial Roundtables: Ongoing; and
- Auditor General of Canada: Ongoing

Reports commissioned by various agencies and departments of the Government of Canada are available to the public in electronic format where they can be easily accessed by industry stakeholder organizations and their membership. Frequently, the work undertaken by the government bodies is informed by expert witnesses and leading stakeholder representatives who appear and provide their perspectives and advice. Recommendations contained in these reports must be addressed by the appropriate department, typically within a prescribed timeframe; responses are also published.

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 C1 provides guidance for harmonisation where a fishery in assessment overlaps with an already certified fishery.

Overlapping between the already certified Eastern Canada offshore lobster (LFA 41), Iles-de-la-Madeleine lobster fishery (LFA 22), and the Maine lobster fisheries (U.S.) does not occur as the SGSL lobster stock is distinct from Iles-de-la-Madeleine, Maine and Canada Eastern offshore lobster stocks. In its 1995 Report, the FRCC has defined Lobster Productivity Areas (LPAs) distinct from the LFAs which are management units. The LPAs were defined based on lobster biological characteristics (growth, recruitment), environmental characteristics (water temperature, substract), and the possibility of lobster exchange between LPAs (adult migration, larval dispersal). LPAs were defined for conservation purposes. Iles-de-la-Madeleine and SGSL have been considered as distinct LPAs (Figure 109). Migration of adults from Magdalen Islands to other areas in the Gulf of St. Lawrence is not possible due to physical barrier (water temperature). The larval dispersal is likely limited due to currents regime.

Also, the SGSL, the Scotian Shelf and the Southwestern have been considered as distinct LPA (Figure 109). Bottom temperatures are low enough to limit lobster movement in deeper areas but because depths are relatively shallow throughout much of the southern Gulf movement of adults throughout this part of the area is possible. Relatively deep water with cold bottom temperatures between eastern Northumberland Strait and western Cape Breton limit movement of adults between these areas. Water temperature in deeper offshore Scotian Shelf waters is cold, constraining offshore movement of lobsters. Surface drift is generally southwest along the Scotian Shelf coast limiting larval dispersal to the offshore area.

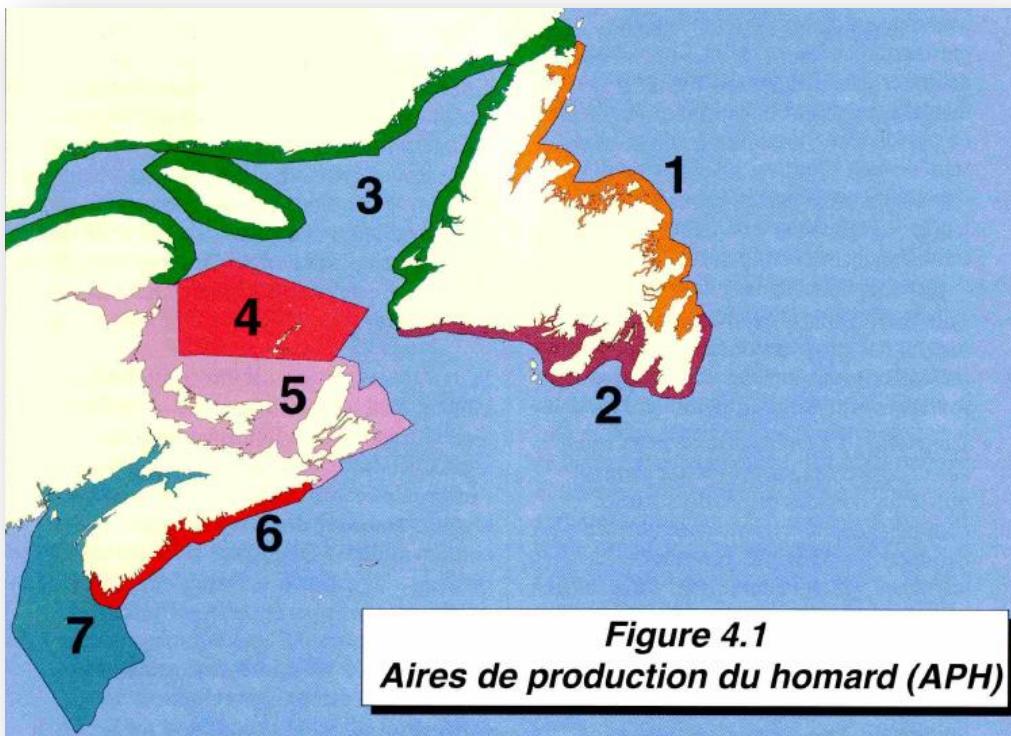


Figure 109. Lobster Productivity Areas (LPAs). Iles-de-la-Madeleine: LPA 4 and SGSL: LPA 5. Source: FRCC 1995.

Lobsters are known to migrate seasonally in response to the seasonal change in water temperatures and climate conditions. Tagging studies have shown a fair exchange of mature lobster between inshore and offshore waters off southwestern NS, with few lobsters reaching as far afield as Georges Banks (Campbell and Stasko 1985; Campbell 1989). However, long-range movement of adult lobsters from the outer Atlantic coast of Nova Scotia to offshore banks is extremely rare and there are no records of long-range movements of adult lobsters out of or into the Gulf of St Lawrence (Harding et al. 1997). A tagging study by Bowlby et al. (2008) showed that stock mixing among management zones (LFAs) was not observed.

Lobster larval dispersal and circulation patterns suggest that there is likely a high degree of connectivity between exploited populations in the Northwestern Atlantic. Larval dispersal and population genetics studies in the SGSL all suggest that the lobster population in this region can be considered homogeneous (Harding et al. 1997; Chassé and Miller 2010). Harding et al. (1997) indicated that lobsters from the Southern Gulf of St Lawrence, Nova Scotia and Georges Bank are not genetically isolated. However, the authors observed that Gulf of St Lawrence lobsters were about three times as genetically distant from Nova Scotia and Georges Bank lobsters. This slight genetic distinction might have evolved in response to the predominantly “one way” drift of larvae from the Gulf of St Lawrence, forming a partial hydrographic barrier to gene flow. In a more recent genetic study, Kenchington et al. (2009) found that samples in the Gulf of St. Lawrence, with low genetic differentiation, differed from samples from Fundy to Cape Cod, in which genetic differentiation is higher. This is postulated to result from a shelf-edge post-glacial colonisation process, in which lobsters forced onto the southern continental slopes by low temperature and falling water level during the last ice age later re-colonised northwards along the slope and into newly available embayments as the ice retreated, thus creating a south-north genetic difference that

is now maintained by contemporary patterns of bathymetry, temperature, and circulation. Deep water lobster populations along the shelf could then be a relic of this post-glacial expansion.

A review of the Assessment Framework was held for LFAs- 34-38 on July 2012. One outcome of the Framework was the confirmation of two distinct stock units: LFA 34 and LFA 35-38 (DFO 2013d).

A study on the connectivity of lobster populations in the coastal Gulf of Maine (Incze et al 2010) suggested that lobster selfrecruitment was important. The inshore concentration of hatching, coupled with faster development, contributed to a slow transport along the coast.

As a result, lobsters in the SGSL (UoC 1), East Scotian Shelf (UoC 2), Southwestern Scotian Shelf (UoC 3) and Bay of Fundy (UoC 4) are considered as distinct biological units from LFA 41 and Maine lobster fisheries.

The PEI lobster fishery (LFAs 24, 25 and 26A) was certified the 6th November 2014. The assessment team harmonized the assessment tree, the outcomes and conditions for the UoC 1 LFAs 23, 25, 26A and 26B (Table 73).

Table 73. Performance Indicators score for the PEI lobster trap fishery and the UoC 1 of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fishery.

Performance Indicators	PEI lobster trap fishery	This assessment
1.1.1	90	90
1.1.2	Default score of 80	Default score of 80
1.1.3	NS	NS
1.2.1	85	85
1.2.2	70	65
1.2.3	80	80
1.2.4	Default score of 80	Default score of 80
2.1.1	60	70
2.1.2	60	70
2.1.3	90	90
2.2.1	100	100
2.2.2	80	80
2.2.3	70	70
2.3.1	100	85
2.3.2	95	85
2.3.3	80	80
2.4.1	80	80
2.4.2	95	95
2.4.3	90	90
2.5.1	100	100
2.5.2	100	100
2.5.3	80	80
3.1.1	90	90
3.1.2	90	90
3.1.3	90	90
3.1.4	100	100
3.2.1	100	100
3.2.2	90	90
3.2.3	95	95
3.2.4	70	70
3.2.5	90	90

The difference in score for PIs 1.2.2, 2.1.1, 2.1.2, 2.3.1 and 2.3.2 results from additional information/data and revision of scores after stakeholder comments on the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries PCDR. These scores for PEI lobster fishery will be adjusted at surveillance audits.

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

- 5.2. 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.
- 5.3. 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.
- 5.4. 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;

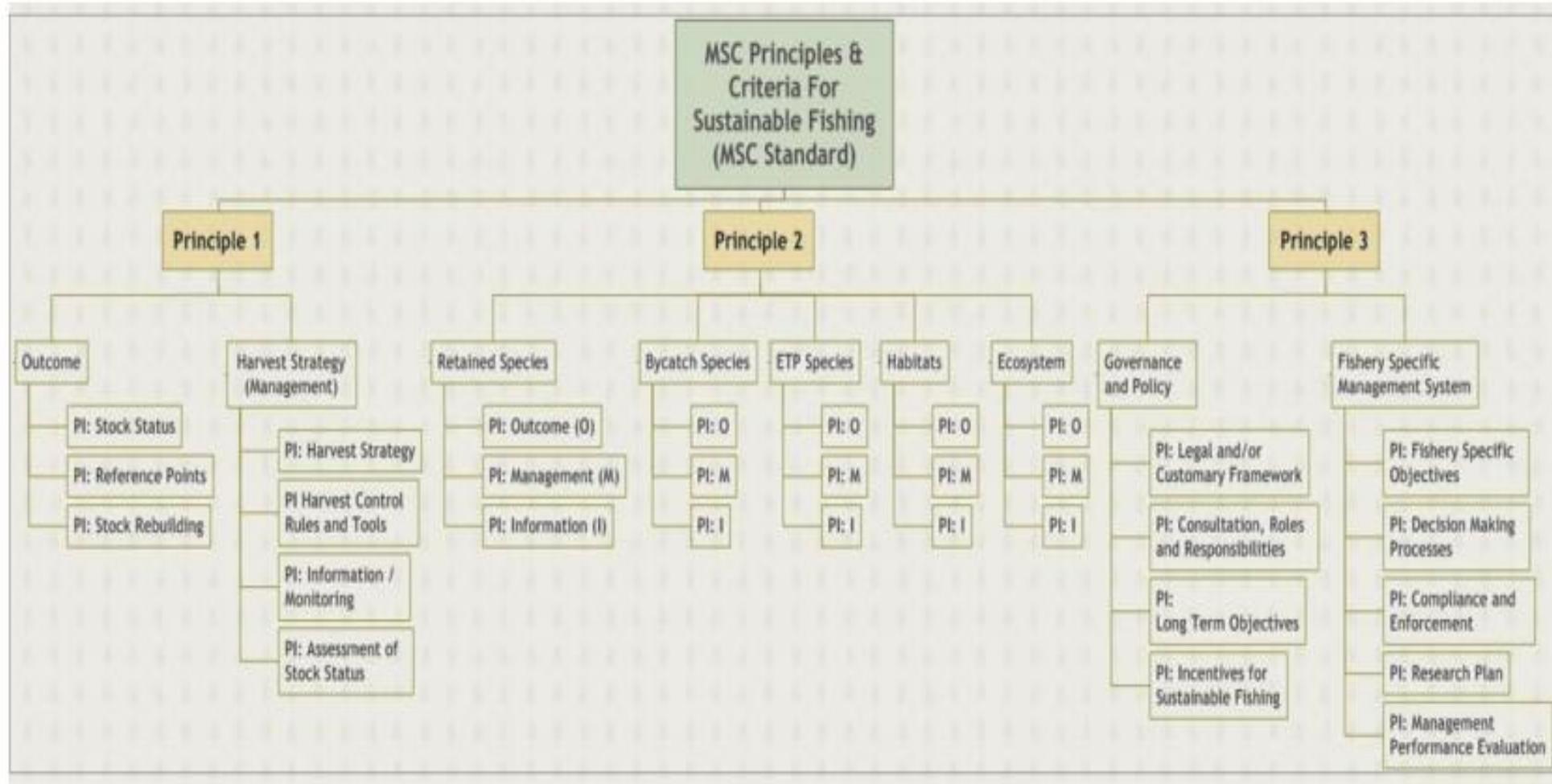
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource;
11. contains appropriate procedures to effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies 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
MSC PSA Worksheet	1.1



5.4 Evaluation Processes and Techniques

5.4.1 Site Visits

Initial consultation meetings were held in Moncton (NB), Halifax (NS) and St John (NB) April 2014. 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 Moncton, Halifax and St John and are recorded in Table 75.

5.4.2 Consultations

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

Table 74. Stakeholder consultation process

Date	Purpose	Media
04/03/2014	Fishery Enters Full Assessment	Notification on MSC website. Direct email/letter.
04/03/2014	Assessment Team Nominations	Notification on MSC website
18/03/2014	Assessment Team Confirmation	Notification on MSC website
18/03/2014	Default Assessment Tree with use of the RBF Released for Comments	Notification on MSC website
18/03/2014	Site Visit Scheduled	Notification on MSC website Direct email/letter
	Confirmation of assessment tree	Notification on MSC website
April 2014	Site Visit	Stakeholder Consultation Meetings
1 st July 2014	Preliminary Draft Report	Notification to Client

26 th August 2014	Peer Reviewers proposed	Notification on MSC website
9 th September 2014	Peer Reviewers confirmed	Notification on MSC website
9 th September 2014	Revised timeline	Notification on MSC website Direct email/letter
16 th October 2014	Revised timeline	Notification on MSC website Direct email/letter
13 th January 2015	Revised timeline	Notification on MSC website Direct email/letter
22 nd January 2015	Public Comment Draft Report released	Notification on MSC website Direct email/letter
28 th April 2015	Final Report and Determination released	Notification on MSC website Direct email/letter

Table 75. Summary of consultation meetings during the April 2014 site visit.

Date	Organization	Location	Staff Represented	Overview/Key Items
Monday, April 21st 2014				
4.00 pm to 6.00 pm	Assessment Team Internal Meeting	Holiday Inn Halifax Harbourview, Dartmouth, NS	SAI Assessment Team	Priority information requests. Key discussion points.
Tuesday, April 22nd 014				
9.00 am to 11.30 pm	Client (opening meeting)	Clear water offices, Bedford, NS	SAI Assessment Team Catherine Boyd Eugene O'Leary Geoff Irvine Peter Norworthy	All UoCs Brief overview of main issues in the fishery, fleet structure, retained and bycatch species, interactions with ETP species, consultation process, decision-making process, incentives for sustainable fishing, management performance evaluation, challenges in NB/NS lobster fishery, chain of custody
3.00 pm to 4.30 pm	FSRS	Bedford Institute of Oceanography, Dartmouth, NS	SAI Assessment Team Shannon Scott-Tibbetts Peter Norsworthy Eugene O'Leary	UoCs 2 and 3 Role of the FSRS, Projects on ecology and biology of lobster populations, Information and monitoring on the lobster stock , stock assessment, information on bycatch species
Wednesday, April 23rd 2014				
9.00 am to 2.00 pm	DFO Maritimes Science and Management	DFO Offices, Dartmouth, NS	SAI Assessment Team Peter Norsworthy Doug Pezzack Scott Coffen-Smout John Tremblay Gerard Peters Odette Murphy Tammy Rose-Quinn Rhea King Kristian Curran	UoCs 2, 3 and 4 Stock assessment, reference points and HCRs, interactions with ETP species, habitat maps, IFMP, transparency of decision-making, compliance and enforcement, fishery-specific objectives, precautionary approach, research plan, management performance evaluation.

Thursday, April 24th 2014				
10.00 am to 12.00 am	DFO Gulf C&P	DFO Offices, Moncton, NB	SAI Assessment Team Peter Norsworthy Manon Mallet John MacOntyre Jonathan Breault	UoC 1 Interactions with ETP species, incentives for sustainable fishing, MCS, C&P organization in the SGSL, compliance and enforcement strategy, violations.
1.00 pm to 3.00 pm	NB DAAF	NB DAAF offices, Moncton, NB	SAI Assessment Team Peter Norsworthy Joseph Labelle Daniel Matthews	UoC1 Role of the DAAF, Minister's roundtable, lobster processing, incentives for sustainable fishing, consultation, roles and responsibilities, decision-making processes.
Friday, April 25th 2014				
9.00 am to 3.00 pm	RBF meeting	V Hotel & Suites meeting room, Moncton, NB	SAI Assessment Team Peter Norsworthy Tony Gaudet Michel Comeau Manon Mallet Leroy Mac Eachern Leonard Leblanc Gaëtan Robichaud Sylvio Richard Jordan Nikoloyuk Carl Allen Michel Richard Dan MacDougall Ron Heighton	UoC 1 Presentation of the MSC program Presentation of MSC's RBF set of methods SICA and PSA for PI 1.1.1 Stock Status SICA for PI 2.2.1 Bycatch species Incentives for sustainable fishing, decision-making and consultation processes
Monday, April 28th 2014				
9.00 am to 4.00 pm	RBF meeting	Holiday Inn Harbour Side meeting room, St John, NB	SAI Assessment Team Peter Norsworthy Melanie Sonnenberg Laurence Cook Dan Mitcholl Eric Lockhart Maria Pecchia Greg Thompson DFO Maritimes staff by conference call: Tammy Rose-Quinn, Rhea King, Andrew Newbould, Gerard Peters	UoC 4 Presentation of the MSC program Presentation of MSC's RBF set of methods SICA and PSA for PI 1.1.1 Stock Status Retained and bycatch species, interaction with ETP species, incentives for sustainable fishing, decision-making and consultation processes
Tuesday, April 29th 2014				
9.00 am to 4.00 pm	RBF meeting	Holiday Inn Halifax Harbourview meeting room, Dartmouth, NS	SAI Assessment Team Peter Norsworthy Nellie Burker Stevens Chris Harris Veronika Brzeski Sarah Delorey Ginny Boudreau Lori Baker Ashton Spinney	UoCs 2 and 3 Presentation of the MSC program Presentation of MSC's RBF set of methods SICA and PSA for PI 1.1.1 Stock Status Retained and bycatch species, incentives for

			Patrick Gray Robert Thines John Couture John Tremblay Doug Pezzack Andrew Newbould Tammy Rose-Quinn Shannon Scott-Tibbetts	sustainable fishing, decision-making and consultation processes
Wednesday, April 30th 2014				
9.00 am to 11.00 am	WWF Canada	WWF offices, Halifax, NS	SAI Assessment Team Tonya Wimmer Sean Brillant	All UoCs ETP species inhabiting the SGSL, Scotian Shelf and Bay of Fundy; entanglement of Atlantic right whales, mitigation strategy in the Bay of Fundy and the Scotian Shelf
1.00 pm to 2.30 pm	Client (closing meeting)	Clear water offices, Bedford, NS	SAI Assessment Team Catherine Boyd Geoff Irvine Peter Norworthy	All UoCs Summary of the different meetings, information gaps and concerns for each principle, recap of timeline and next steps of the assessment.

5.4.3 Evaluation Techniques

The weights that shall be assigned to each component (e.g. Harvest Strategy, By-catch, ETP, Fishery-Specific Management System) and PI within the assessment tree structure. Each level of the assessment tree shall sum to 1. Equal weighting shall be given to each branch of the Assessment Tree that lies at the same Level.

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 issues¹¹⁴ specified in a SG.

¹¹⁴ Scoring issues: The different parts of a single scoring guidepost, where more than one part exist covering related but different topics.

- 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):
 - 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.
 - 65: all issues meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
 - 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.
 - 75: all issues meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
 - 80: all issues meet SG80.
 - 85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100.
 - 90: all issues meet SG80; some achieve higher performance at SG100 but some do not.
 - 95: all issues meet SG80; most achieve higher performance, at SG100; only a few fail to achieve SG100.
 - 100: all issues meet SG100.

Table 76. 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	<u>Either</u> 0.5	0.25	<u>Or</u> 0.333 0.1667
				1.1.2	Reference points	0.5	0.25	0.333 0.1667
				1.1.3	Stock rebuilding			0.333 0.1667
	1	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	
Two	1	Retained species	0.2	1.2.4	Assessment of stock status	0.25	0.125	
				2.1.1	Outcome	0.333	0.0667	
				2.1.2	Management	0.333	0.0667	
	1	By-catch species	0.2	2.1.3	Information	0.333	0.0667	
				2.2.1	Outcome	0.333	0.0667	
				2.2.2	Management	0.333	0.0667	
	1	ETP species	0.2	2.2.3	Information	0.333	0.0667	
				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 2.4.2 2.4.3	Outcome Management Information	0.333 0.333 0.333	0.0667 0.0667 0.0667	
		Ecosystem	0.2	2.5.1 2.5.2 2.5.3	Outcome Management Information	0.333 0.333 0.333	0.0667 0.0667 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. The date was revised from a previous date to accommodate the identification of any existing lobster product from the under assessment fishery and held in frozen storage by supply chain entities that are already certified to the MSC Chain of Custody Programme. This product may become eligible for identification with an MSC claim on eventual certification of the fishery.

The initial proposed target eligibility date was February 2014 as the PCDR was initially scheduled to be published in August 2014. The PCDR is published on January 22, 2015. Therefore the target eligibility date is now July 22, 2014.

There is no risk of loss in the traceability, segregation and identification systems. As purchase slips contain the date of purchase and harvester logbooks contain the date of catch, the fishery and trade system can differentiate product from that sold prior to July 22 2014 and that sold from that date onwards. The target eligibility date is for product sold from the client group from July 22, 2014 onwards.

6.2 Traceability within the Fishery

6.2.1 Introduction

Lobsters in Atlantic Canada are landed in a very large number of communities throughout a broad geographic region and, once landed are widely distributed through a varied supply chain. In this environment, it is important that consumers and seafood buyers can have confidence that the lobster they are buying can be traced back to the MSC certified Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fishery.

In order to fully capture the various components of the lobster supply chain post capture, industry stakeholders held consultations, including meetings with MSC staff from the UK and Atlantic Canada in the fall of 2013 in order to fully understand and document the supply pathways. These consultations provided an opportunity to present, discuss and confirm the supply routes of lobster from vessel onwards into the market. CABs also attended the industry meeting (Dartmouth, Nova Scotia, October 22nd) and a traceability knowledgeable member of the assessment team, Bob Allain attended on behalf of SAI Global.

The participants noted that many efforts have been completed or are underway to document traceability throughout the lobster distribution system. The industry's trade association, the Lobster Council of Canada (LCC), has carried out an analysis describing the nuances of the lobster supply chain that describes practices that are currently undertaken to ensure traceability in each of the Atlantic Canadian provinces, including NB and NS. Initiatives are ongoing with continued work on how traceability can be further improved in the industry. Arising out of these discussions and activities, the client group provided a document that describes the various lobster supply channels that operate in NB and NS. These resources, meetings and independent review have been used by the assessment team to describe the traceability and eligibility of lobster from the NB and NS assessed fisheries to enter into further chain of custody certification.

Note on overall MSC Certification of Atlantic Canadian Lobster

The supply of lobsters in Atlantic Canada (and in the neighbouring US state of Maine) at this time are either certified, in assessment or have commenced initiation to become certified to the MSC Sustainable Fishery Standard. Given that the entire Atlantic Canadian lobster supply stream should have certification in two or three years, the risk of co-mingling of non-certified with certified product will be removed entirely.

6.2.2 Traceability within the fishery

Lobster fishing permits in NB and NS are held by individuals, by companies and communities. Permits can be transferred from one to another and the transferal process is managed by the DFO Regional Office. This Office holds the official list of registered permit holders for NB and NS lobster fishery. With respect to the MSC certification of the Client Group, it is confirmed that all registered and licensed fishing vessels operating in the certified areas are eligible to be covered by the MSC certification. This commitment is subject to their compliance with policies, terms and conditions of the Client Group. There are confidentiality obligations in place under Canadian Law that limits the ability for the list to be distributed from DFO although submissions can be made by the assessment team to confirm that Client Group harvesters have permits for the UoC LFAs.

Tracking, tracing and segregation systems within the fishery

At-Sea Processing

There is no at sea processing activity associated with these UoCs. Harvesters do not hold permits to process lobster at sea. All lobsters are landed alive.

At-sea transhipment

There is no at sea transhipment activity associated with these UoCs.

Harvester Log Book

Logbooks are mandatory, and can be used to record information that can be used to confirm traceability to these UoCs. The logbook will consist of a record of every fishing trip. As a condition for license, all harvesters fishing for lobster will be required to record catch details in this logbook. Relevant information recorded for traceability purposes includes; vessel name and registration number, method of capture, location fished on a daily basis (by LFA) and estimation of weight of fish caught in metric or imperial. The logbook returns will be made to the Regional DFO office.

Buyer Fish Slips and Weekly Returns

The number of licences is limited in each LFA (Table 10, 11, 12 and 13). The lobster licence is single LFA specific, so the licence holder cannot fish lobster in another LFA than the one he's licenced for. A list of licence holders/vessels name is updated at each lobster fishing season and is available to buyers. Purchases of lobsters must be documented on a purchase slip by the registered buyer containing details of purchases within a week. Information on the purchase slip includes the name of the permit holder, the name of the fishing vessel, the place of landing and the quantity of product per permit holder. Therefore, the system allows buyers to know which LFA so which UoC the fishing vessel/licence holder is part of.

Upon landing, harvesters work with dealers to complete landing documentation as required by condition of the NB and NS fish buyers licence. As a condition of license, NB and NS receives weekly buying activity summaries by port, lobster size (canners and markets) and price by size from the licensed buyers. Buyers must generate accurate detailed purchase slips regarding each landing from harvesters including vessel identification, landing port, date, landed weight and value. Fish buying licence holders are also subject to physical inspection by provincial authorities to ensure compliance to licence conditions.

The purchase slip booklets are obtained from the Regional DFO Office. They are used for other fisheries but buyers must identify species in each case. When a purchase slip is generated for each landed purchase of lobster, two carbon copies are generated. One is retained in the booklet, one is received by the harvester and one copy is returned to DFO Regional Statistical office.

This creates options for catch reporting and verification using logbook, purchase slips (DFO) and weekly returns to the Provincial Government Office.

Once submitted to provincial department of fisheries in NB and NS, landings data are entered into the department's statistical database and used as information to publish provincial landings and values statistics.

All handlers, buyers, agents, distributors, live shippers and processors in all Atlantic Canadian provinces are required by regulation to be licensed with the competent provincial authority. If product harvested by PEI fishermen within the UoC is landed in the neighbouring provinces of Nova Scotia or New Brunswick, buyers are required to be licensed with the Nova Scotia Department of Fisheries and Aquaculture and New Brunswick Department of Agriculture, Aquaculture and Fisheries. Similarly, a copy of the purchase slip must be returned to the local DFO Statistical Office and coming in 2014 in the SGSL, all licenced lobster enterprises will be required to return logbook records. This mandatory logbook submission has been in place in other UoCs in NS for several years.

Most of the front-line participants in the shore-side portion of the industry are independent buyers or agents for processing and live shipping businesses. The role of these buyers normally includes unloading, weighing and transporting landings to those in the industry with national and international distribution capacity, as well as providing services to harvesters such as supplying bait. The role of these buyers and subcontracted agents is primarily to overcome the logistical challenges of servicing the over 9,000 harvesting participants in the Atlantic Canadian industry, many of whom land small quantities of lobster in remote rural communities. For the most part, these buyers align themselves with one or two processors or live shippers, simply acting as agent on their behalf.

The fishery under assessment is defined as the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fishery conducted in LFA 23, 25, 26A and 26B, and LFAs 27-33, LFA 34; and LFAs 35-38. It is legally possible for harvesters to hold entitlements in other regions not within the scope of this assessment although for any that do, or were to consider obtaining permits for other LFAs within proximity to the LFAs in this assessment, these adjacent LFAs are now within the scope of other in assessment lobster fisheries or are already certified fisheries. These are listed below and are presented to confirm that there is both a low and diminishing risk of lobsters being landed from non-certified fisheries and in one instance, an overlapping.

New logbook requirements, landing inspections and sales inspection at the registered buyer and processor also act as deterrents to any potential mis-reporting and non-reporting prior to and at the point of landing.

Table 77. Certified and under assessment Canadian lobster fisheries within proximity of the UoCs.

Fishery Under Assessment	LFA's under the scope of certification	Stage in Assessment
Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster trap fisheries (this one)	LFAs 23, 25, 26A, and 26B (UoC 1) LFAs 27-33 (UoC 2) LFA 34 (UoC 3) LFAs 35-38 (UoC 4)	PCDR issued in January 2015
Prince Edward Island Lobster trap fishery	LFA 24, 25 and 26A	Certified in November 2014
Easter Canada offshore lobster	LFA 41	Certified in May 2010, re-assessment started in April 2014, PCDR issued in March 2015

Iles-de-la-Madeleine Lobster Trap fishery	LFA 22	Certified July 2013
Gaspésie Lobster Trap Fishery	LFAs 19, 20 and 21	PCR issued in March 2015

Risk of substitution of certified lobster with non-certified lobster past the point of landing has been reviewed at each step from first and subsequent transfer and the outcome of the review presented with respect to the eligibility to enter further chains of custody.

There is a functioning system in place for recording the landed catches from the in assessment fishery through the purchase records that must be completed as part of the licensing requirements of buyers. This will be augmented in 2014 in the SGSL by the harvester logbook returns, which will provide a record of harvester catches by trip and LFA.

As stated, purchase slips must be generated for each landing purchased and contain vessel identification, landing port, date, landed weight and value.

6.3 Eligibility to Enter Further Chains of Custody

To be eligible for labelling with the MSC eco-label, the product must originate from a member of the fishery certificate. It can then enter further supply chains that are included either within the fishery certificate or covered by a separate CoC certificate.

MSC rules require that buyers who take title of product are required to hold CoC certification under MSC rules unless they are included in the fishery certificate. However, there are a number of buyers that only trade NB and NS Lobsters from members of the client group who's scope is extremely limited to purchasing and selling the lobster back to members of the fishery certificate who process and ship lobster products. The requirement and eligibility for MSC claim and CoC are described for each of the entities that feature in the lobster supply chain.

(i) Entities included in the Fishery Certificate Ownership Structure

Member harvester vessels that operate within the Client Group Certificate and land lobster for sale from the certified LFAs do not require CoC certification.

Processor members who process lobsters from the certified LFAs will require CoC Certification if they require these products to carry the MSC claim.

Exceptions may occur to buyers working within the MSC fishery certificate client group that do not transform the product but sell live lobsters only.

(ii) Buyers who purchase exclusively from harvesters and sell to processors or live shippers within the unit of certification

Buyers who purchase only from the certified LFA's within this certificate and sell live lobsters to processors or live shippers within this certificate do not require CoC certification.

However, if the buyer also sells live lobsters outside of the fishery certificate client group membership, then this buyer will require CoC certification (as in (iii) below).

(iii) Buyers who sell live lobster to processors or live shippers who are not part of the fishery certificate

Buyers who sell live lobster to processors or live shippers who are not part of the fishery certificate client group will require separate chain of custody certification. If the processor or live shipper is part of the client group then the buyer selling to that processor or live shipper does not need CoC (as per (ii) above). If the processor or live shipper is not part of the client group then the buyer selling to that processor or live shipper would need to belong to the client group and would also need to have CoC in order to sell as MSC certified to that processor or live shipper that is outside the fishery certificate client group.

(iv) All Processors/Live Shippers

All processors or live shippers of lobster both within the client group and those purchasing lobster directly from harvesters of the fishery client group, from a buyer only selling within the client group, or from another chain of custody certified buyer will require CoC certification if they wish to sell the lobster as MSC certified.

This fishery does not fall within the scope criteria for Inseparable or Practically Inseparable (IPI) stock(s) to enter further CoC and so is not considered as such.

7. Evaluation Results

7.1. Principle level score

Table 6.1: Final Principle Scores

UoC 1

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	81.3
Principle 2 – Ecosystem	85.3
Principle 3 – Management System	90.8

UoCs 2, 3 and 4

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	80.3
Principle 2 – Ecosystem	83.7
Principle 3 – Management System	89.3

7.2. Summary of Scores

UoC 1

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	80
				1.1.3	Stock rebuilding	0.333	0.1667	NS
	1	Management	0.5	1.2.1	Harvest strategy	0.25	0.125	85
				1.2.2	Harvest control rules & tools	0.25	0.125	65
				1.2.3	Information & monitoring	0.25	0.125	80

				1.2.4	Assessment of stock status	0.25	0.125	80
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	70
				2.1.2	Management	0.333	0.0667	70
				2.1.3	Information	0.333	0.0667	90
		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	70
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667	85
				2.3.2	Management	0.333	0.0667	85
				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	95
				2.4.3	Information	0.333	0.0667	90
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667	100
				2.5.2	Management	0.333	0.0667	100
				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	90
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	90
				3.1.3	Long term objectives	0.25	0.125	90
				3.1.4	Incentives for sustainable fishing	0.25	0.125	100
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1	100
				3.2.2	Decision making processes	0.2	0.1	90
				3.2.3	Compliance & enforcement	0.2	0.1	95
				3.2.4	Research plan	0.2	0.1	70
				3.2.5	Management performance evaluation	0.2	0.1	90

UoCs 2, 3, 4

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	85.9
				1.1.2	Reference points	0.5	0.25	80
				1.1.3	Stock rebuilding	0.333	0.1667	NS
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125	85
				1.2.2	Harvest control rules & tools	0.25	0.125	65
				1.2.3	Information & monitoring	0.25	0.125	80
				1.2.4	Assessment of stock status	0.25	0.125	80
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	70
				2.1.2	Management	0.333	0.0667	70
				2.1.3	Information	0.333	0.0667	85
		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	75
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667	85
				2.3.2	Management	0.333	0.0667	85
				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	95
				2.4.3	Information	0.333	0.0667	90
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667	100

			2.5.2	Management	0.333	0.0667	100	
			2.5.3	Information	0.333	0.0667	80	
Three	1	Governance And policy	0.5	3.1.1	Legal & customary framework	0.25	0.125	90
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	90
				3.1.3	Long term objectives	0.25	0.125	90
				3.1.4	Incentives for sustainable fishing	0.25	0.125	100
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1	80
				3.2.2	Decision making processes	0.2	0.1	95
				3.2.3	Compliance & enforcement	0.2	0.1	95
				3.2.4	Research plan	0.2	0.1	70
				3.2.5	Management performance evaluation	0.2	0.1	90

7.3. Summary of Conditions

Table 6.3: Summary of Conditions

UoC 1

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	The client must provide evidence of implementation of well-defined harvest control rules that reduce exploitation rates as the limit reference point is approached.	1.2.2	NA
2	The client must provide evidence that a partial strategy of demonstrably effective management measures is in place such that the Southern Gulf of St Lawrence lobster fishery does not hinder the recovery and rebuilding of the Canadian mackerel stock.	2.1.1	NA
3	The client must provide evidence that a partial strategy is in place to ensure the Southern Gulf of St Lawrence lobster fishery does not hinder the recovery and rebuilding of the Canadian mackerel stock. Also, the client must provide some evidence that the partial strategy is being implemented successfully.	2.1.2	NA
4	Qualitative information and some quantitative information are available on the amount of main bycatch species. The client must provide evidence that accurate and sufficient data on the amount of main bycatch species affected by the fishery are collected to detect any increase in risk to main bycatch species.	2.2.3	NA
5	The client must provide evidence that a written research plan for the fishery 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.	3.2.4	NA

UoCs 2, 3 and 4

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	The client must provide evidence of implementation of well-defined harvest control rules that reduce exploitation rates as the limit reference point is approached.	1.2.2	NA
2	The client must provide evidence that a partial strategy of demonstrably effective management measures is in place such that the East Scotian shelf, Southwestern Scotian Shelf and Bay of Fundy lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock.	2.1.1	NA
3	The client must provide evidence that a partial strategy is in place to ensure the East Scotian shelf, Southwestern Scotian Shelf and Bay of Fundy lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock. Also, the client must provide some evidence that the partial strategy is being implemented successfully.	2.1.2	NA
4	The client must provide evidence that accurate and sufficient data on the amount of bycatch species affected by the fishery are collected to detect any increase in risk to bycatch species.	2.2.3	NA
5	The client must provide evidence that a written research plan for the fishery 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.	3.2.4	NA

7.4. Determination, Formal Conclusion and Agreement

The Certification Committee of SAI Global has determined that:

- The **Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence** lobster trap fisheries are to be awarded certification to the Marine Stewardship Council Sustainable Fishing Standard.

SAI Global hereby publicly announces its intention to certify the Fishery Units 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.

References

- AMEC Earth & Environment 2007. Northumberland Strait Ecosystem Overview Report. Final report. Submitted to DFO Gulf, Moncton, New Brunswick.
- Atlantic Leatherback Turtle Recovery Team 2006. Recovery Strategy for Leatherback Turtle (*Dermochelys coriacea*) in Atlantic Canada. *Species at Risk Act Recovery Strategy Series*. Fisheries and Oceans Canada, Ottawa, vi + 45 pp.
- Auster P. J. 1989. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrate (North Atlantic and Mid-Atlantic) Tautog and Cunner. Biological Report 82 (11.105) U.S. Fish and Wildlife Service, National Marine Research Center, Seattle.
- Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., Savaria, J.-Y., 2009. Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. *Species at Risk Act Recovery Strategy Series*. Fisheries and Oceans Canada, Ottawa. 62 pp.
- Bianchi, G., Gislason, H., Graham, K., Hill, L., Jin, X., Koranteng, K., Manickchand-Heileman, S., Payá, I., Sainsbury, K., Sanchez, F., and Zwanenburg, K. 2000. Impact of fishing on size composition and diversity of demersal fish communities. *ICES Journal of Marine Sciences*, 57: 558-571.
- Boudreau S.A. and B. Worm 2010. Top-down control of lobster population in the Gulf of Maine: insights from local ecological knowledge and research surveys. *Marine Ecology Progress Series* 403: 181-191.
- Bowlby, H.D., Hanson, J.M., and Hutchings, J.A. 2008. Stock structure and seasonal distribution patterns of American lobster, *Homarus americanus*, inferred through movement analyses. *Fisheries Research*. 90: 279-288.
- Brown, M.W., Fenton, D., Smedbol, K., Merriman, C., Robichaud-Leblanc, K., and Conway, J.D. 2008. Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters [Proposed]. *Species at Risk Act Recovery Strategy Series*. Fisheries and Oceans Canada. vi + 63p.
- Brzeski V. 2011. Science and Governance for LFA 27. LFA 27 Management Board.
- Brzeski V. 2014. A report on the Science and Governance activities of LFA 27, 2011-2014. LFA 27 Management Board.
- Campbell, A. 1989. Dispersal of American lobsters, *Homarus americanus*, tagged off southern Nova Scotia. *Canadian Journal of Fisheries and Aquatic Science* 46: 1842-1844.
- Campbell, A., and Stasko, A.B. 1985. Movements of tagged American lobsters, *Homarus americanus*, off southwestern Nova Scotia. *Canadian Journal of Fisheries and Aquatic Science* 42: 229-238.
- Campbell, J. S and Simms, J.M. 2009. Status on Coral and Sponge Conservation in Canada, DFO: vii + 87 p.
- Chassé, J. and Miller, R.J. 2010. Lobster larval transport in the Southern Gulf of St. Lawrence. *Fisheries Oceanography* 19: 5, 319-338.

Chen, Y. and S. S. Montgomery 1999. Modeling the dynamics of eastern rock lobster, *Jasus verreauxi*, stock in New South Wales, Australia. *Fisheries Bulletin* 97: 25-38.

Chuenpagdee, R., Morgan, L.E., Maxwell, S.M., Norse, E.A., and Pauly, D. 2003. Shifting gears: collateral impacts of fishing methods in U.S. waters. *Frontiers in Ecology and Environment* 1(10): 517-524.

Comeau, M. and Savoie, F. 2002. Maturity and reproductive cycle of the female American lobster, *Homarus americanus*, in the Southern Gulf of St. Lawrence, Canada. *Journal of Crustacean Biology* 22(4): 762-774.

Comeau, M., Hanson, J.M., Mallet, M., and Chassé, J. 2008. Framework and assessment for American lobster, *Homarus americanus*, fisheries in the Southern Gulf of St Lawrence: LFA 23, 24, 25, 26A and 26B. *Can. Sci. Advis. Sec. Res. Doc.* 2008/054.

Comeau, P.A., M.J. Tremblay, S. Campana, G. Young, C. Frail and S. Rowe. Review of the St. Mary's Bay Longhorn Sculpin Fishery. 2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/051. Vi + 75 p.

Cowan, D.E., Atema, J. 1990. Moult strategy and serial monogamy in American lobster, *Homarus americanus*. *Animal Behaviour* 39: 1199-1206.

Delorey, S. 2013. Overview of Incidental Bycatch and Live Discards for areas LFAs 31A and 31B. Based on the Guysborough County Inshore Fishermen's Association At-Sea sampling data from 2009-2013.

den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. *Can. Tech. Rep. Fish. Aquat. Sci.* 2890: vii + 39 p.

DFO 1998. Le homard des eaux côtières du Québec. Rapport sur l'état des stocks C4-O5. 13P.

DFO 2001. Gaspereau Maritime Provinces overview. DFO Science Stock Status Report D3-17 (2001).

DFO 2003. 2003-2006 Scotia-Fundy Fisheries Integrated Herring Management Plan, NAFO subdivision 4WX, 4Vn and 5Z. DFO.

DFO 2004. Proceedings of Species at Risk Atlantic Zonal Assessment Process – Determination of Allowable Harm for Spotted and Northern Wolffish; May 7, 2004, St. John's, Newfoundland and Labrador. *DFO Can. Sci. Advis. Sec. Proceed. Ser.* 2004/028.

DFO 2005a. Proceedings of the Maritimes Provinces Regional Advisory Process on Scotia-Fundy Groundfish Stocks; 31 October – 3 November 2005. *DFO Can. Sci. Advis. Sec. Proceed. Ser.* 2005/032.

DFO 2005b. The Gulf of St. Lawrence, A Unique Ecosystem. The stage for the Gulf of St. Lawrence Integrated Management (GOSLIM). DFO Oceans and Science Branch. Cat. No. FS 104-2/2005.

DFO 2007a. Integrated Fisheries Management Plan for the Atlantic Mackerel, effective from 2007.

DFO 2007b. Ecologically and biologically significant areas (EBSA) in the estuary and Gulf of St. Lawrence: Identification and characterization. *DFO Can. Sci. Advis. Sec. SAR* 2007/016.

DFO 2007c. Recovery potential assessment for Right whale (Western North Atlantic population). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/027.

DFO 2008. Framework and Assessment for the American Lobster, *Homarus americanus*, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.

DFO 2010. Potential impacts of fishing gears (excluding mobile bottom-contacting gears) on marine habitats and communities. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2010/003.

DFO 2011a. Integrated Fishery Management Plan for Inshore Lobster in Lobster Fishing Areas 27-38. Scotia-Fundy Sector. DFO Maritimes Region.

DFO 2011b. Assessment of Lobster off the Atlantic Coast of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2011/064.

DFO 2011c. Recovery Potential Assessment (RPA) FOR THE Southern Designatable Unit (NAFO Divs. 4X5Yb and 5Zjm) of Atlantic Cod (*Gadus morhua*). DFO Can. Sci. Advis. Sec. Adv. Rep. 2011/034.

DFO 2012a. A Brief History of the Lobster Fishery in the Southern Gulf of St. Lawrence. DFO Gulf Region. Cat. No. Fs149-6/2012E-PDF, ISBN 978-1-100-20682-0.

DFO 2012b. Notice to Fish Harvesters – Lobster Conservation Harvesting Plan for LFA 23, 24, 25, 26A and 26B for 2012 to 2014. DFO Gulf Region, April 24, 2012. EKME 2559150.

DFO 2012c. Notice to Fish Harvesters – Requirements for modified biodegradable panels on lobster traps for all Lobster Fishing Areas in the Southern Gulf of St. Lawrence. DFO Gulf Region, June 22, 2012. EKME 2608173.

DFO 2012d. Notice to Fish Harvesters – Lobster Conservation Harvesting Plan LFA 25 for 2012 to 2014. DFO Gulf Region, July 20, 2012. EKME 2607101.

DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.

DFO 2012f. Assessment of Atlantic herring in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/014.

DFO 2012g. Definitions of harmful alteration, disruption or destruction (HADD) of habitat provided by eelgrass (*Zostera marina*). DFO Can. Sci. Advis. Sec. SAR 2011/058.

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

DFO 2012i. Marine Protected Area Network Planning in the Scotian Shelf Bioregion: Objectives, Data, and Methods. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/064.

DFO 2013a. Notice to fish Harvesters – Lobster Conservation Harvesting Plan – New Management Measures for 2013 and beyond (LFA 23, 24, 25, 26A and 26B). DFO Gulf Region, April 19, 2013. EKME 2787909.

DFO 2013b. American lobster, *Homarus americanus*, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.

DFO 2013c. Assessment of the rock crab (*Cancer irroratus*) fishery in the southern Gulf of St. Lawrence for 2006 to 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/030.

DFO 2013d. Assessment of lobster (*Homarus americanus*) in Lobster Fishing Area (LFA) 34. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/024.

DFO 2013e. Assessment of lobster (*Homarus americanus*) in Lobster Fishing Areas (LFA) 35-38. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/023.

DFO 2013f. 2013 Assessment of 4VWX herring. DFO Can. Sci. Advis. Sci. Sec. Sci. Advis. Rep. 2013/045.

DFO 2013g. Assessment of scallops (*Placopecten magellanicus*) in scallop fishing area (SFA) 29 West of longitude 65°30'W. Canadian Science Advisory Secretariat Maritimes Region Science Advisory Report 2013/055.

DFO 2013h. American lobster, *Homarus americanus*, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.

DFO 2014a. Reference points options for the southern Gulf of St. Lawrence lobster stock. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/nnn.

DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.

DFO 2014c. Integrated Fisheries Management Plan for Lobster in the Southern Gulf of St Lawrence, Lobster Fisheries Areas 23, 24, 25, 26A and 26B. DFO Gulf Region.

DFO 2014d. Update to the Recovery Potential for Cusk in Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/048.

DFO 2014e. Stock Status Update of Cusk (*Brosme brosme*) in NAFO Divisions 4VWX5Z Under The Precautionary Approach Framework. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/019.

DFO 2014f. Proceedings of a Maritimes Science Peer review of the Lobster Fishing Areas (LFAs) 34-35 Lobster (*Homarus americanus*) Assessment; February 12-14, 2013. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2014/041.

DFO 2015. 2014 4X5Yb Atlantic Cod Stock Status Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/nnn.

Dutil J.-D., S. Proulx, P. S. Galbraith, J. Chassé, N. Lambert and C. Laurian 2012. Coastal and epipelagic habitats of the estuary and Gulf of St. Lawrence. Can. Tech. Rep. Fish. Aquat. Sci. 3009: ix + 87 pp.

Dufour, R. and Ouellet, P. 2007. Estuary and Gulf of St. Lawrence marine ecosystem overview and assessment report. Can. Tech. Rep. Fish. Aquat. Sci. 2744E: vii + 112 p.

Fogarty, M.J. and L. Gendron 2004. Biological reference points for American lobster (*Homarus americanus*) populations: limits to exploitation and the precautionary approach. Canadian Journal of Fisheries and Aquatic Science 61: 1392-1403.

FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.

FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.

Fuller S., C. Picco, J. Ford, C.-F. Tsao, L. E. Morgan, D. Hangaard, R. Chuenpagdee 2008. How We Fish Matters: Addressing the Ecological Impacts of Canadian Fishing Gear. Ecology Action Centre, Living Oceans Society, and Marine Conservation Biology Institut. ISBN 978-0-9734181-7-0.

Galbraith, P.S., Chassé, J., Larouche, P., Gilbert, D., Brickman, D., Pettigrew, B., Devine, L., and Lafleur, C. 2013. Physical Oceanographic Conditions in the Gulf of St. Lawrence in 2012. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/026. v + 89 p.

Gendron L. et P. Gagnon 2001. Impact de différentes mesures de gestion de la pêche au homard (*Homarus americanus*) sur la production d'oeufs par recrue. Rapp. Tech. Can. Sci. Halieuti. Aquat. 2369: vi + 31 p.

Gendron, L. and G., Savard 2003. Lobster stock status in the Magdalen Islands (LFA 22) in 2002. DFO Can. Sci. Advis. Sec. Res. Doc. 2003/058.

Gendron, L. and B., Sainte-Marie 2006. Growth of juvenile lobster *Homarus americanus* off the Magdalen Islands (Quebec, Canada) and projection of instar and age at commercial size. Marine Ecology Progress Series, 326: 221-233 .

Goñi R. 1998. Ecosystem effects of marine fisheries: an overview. Ocean & Coastal Management 40: 37-64.

Grabowski J.H., J. Gaudette, E.J. Clesceri, P.O. Yund 2009. The role of food limitation in lobster population dynamics in coastal Maine, United States, and New Brunswick, Canada. New Zealand Journal of Marine and Freshwater Research 43: 185-193.

Hanson, J.M. 2009. Predator-prey interactions of American lobster (*Homarus americanus*) in the Southern Gulf of St. Lawrence, Canada. New Zealand Journal of Marine and Freshwater Research 43: 69-88.

Harding, G.C., Kenchington, E.L., Bird, C.J., Pezzack, D.S., and Landry D.C. 1997. Genetic relationships among subpopulations of the American lobster (*Homarus americanus*) as revealed by random amplified polymorphic DNA. Canadian Journal of Fisheries and Aquatic Science 54: 1762-1771.

Harnish L., J.H. Martin Willison, 2008. Efficiency of bait usage in Nova Scotia lobster fishery: a first look. Journal of Cleaner Production (2008), doi:10.1016/j.jclepro.2008.08.005.

Harris, L.E. and A.R. Hanke 2010. Assessment of the Status, Treats and Recovery potential of Cusk (Brosme brosme). DFO Can. Sci. Advis. Sec. Res. Doc. 2010/004. vi + 23 p.

Incze L., H. Xue, N. Wolf, D. Xu, C. Wilson, R. Steneck, R. Wahle, P. Lawton, N. Pettigrew and Y. Chen 2010. Connectivity of lobster (*Homarus americanus*) populations in the coastal Gulf of Maine: part II. Coupled biophysical and dynamics. *Fisheries Oceanography*. 19 (1): 1-20.

Johnson, T.T., Smedbol, R.K., Serdynska, A., Vanderlaan, A., Helcl, N. Harris, L., and Taggart, C.T. 2007. Patterns of fishing gears in areas of the Bay of Fundy and southwest Scotian Shelf frequented by North Atlantic right whales. *Can. Tech. Rep. Fish. Aquat. Sci.* 2745: v + 52 p.

Kenchington, E.L., Harding, G.C., Jones, M.W., and Prodohl P.A. 2009. Pleistocene glaciation events shape genetic structure across the range of American lobster, *Homarus americanus*. *Molecular Ecology* 18: 1654-1667.

Kenchington, E., Lurette, C., Cogswell, A., Archambault, P., Archambault, P., Benoît, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siford, T., Treble, M., and Wareham, V. 2010. Delineating Coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. *DFO Can. Sci. Advis. Sec. Res. Doc.* 2010/041. Vi + 202 pp.

Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolfish (*Anarhichas denticulatus*) and Spotted Wolfish (*Anarhichas minor*), and Management Plan for Atlantic Wolfish (*Anarhichas lupus*) in Canada. *Fisheries and Oceans Canada: Newfoundland and Labrador Region*. St. John's, NL. x + 103 pp.

MacMillan R., M. Comeau, & M. Mallet. 2010. Protecting window-size female American lobster, *Homarus americanus*, to increase egg production. *New Zealand Journal of Marine and Freshwater Research*, 43 (1) : 525-536.

Mallet M., Comeau, B., Gagnon, D. et Comeau, M. 2006. At-sea sampling data collection and fishery regulations for the southern Gulf of Saint Lawrence lobster (*Homarus americanus*) fishery – 1982-2000. *Can. Manusc. Rep. Fish. Aquat. Sci.* 2769 : v +105p.

Miller, R.J., D.S. Moore and J.D. Pringle 1987. Overview of the inshore lobster resources in the Scotia-Fundy region. *CSCPCA Doc. Rech.* 87/85 20p.

Pauly D., V. Christensen, J. Dalsgaard, R. Froese, F. Jr. Torres 1998. Fishing Down Marine Food Webs. *Science* 279: 860-863.

PEIFDARD and DFO 2012. Lobster Resource Monitoring Program. Partnership between the PEI Department of Fisheries, aquaculture & Rural Development and the Department of Fisheries and Oceans Canada. Memorandum of understanding, April 2012.

Pezzack, D.S., Denton, C.M., and Tremblay, M.J. 2014. Overview of Bycatch and Discards in the Maritimes Region Lobster Fishing Areas (LFAs) 27-33 based on *Species at Risk* (SARA) At-sea sampling 2009-2010. *DFO Can. Sci. Advis. Sec. Res. Doc.* 2014/040. V + 27 p.

Robert MacMillan, Michel Comeau & Manon Mallet 2009. Protecting window-size female American lobster, *Homarus americanus*, to increase egg production. *New Zealand Journal of Marine and Freshwater Research* 43:1, 525-536.

Robichaud, D.A., and Frail, C. 2006. Development of Jonah crab, *Cancer borealis*, and rock crab, *Cancer irroratus*, fisheries in the Bay of Fundy (LFAs 35-38) and off southwest Nova Scotia (LFA 34): from exploratory to commercial status (1995-2004). *Can. Manusc. Rep. Fish. Aquat. Sci.* 2775: iii + 48 pp.

Shester, G. and Micheli, F. 2011. Conservation challenges for small-scale fisheries: Bycatch and habitat impacts of traps and gillnets. *Biological Conservation* 144: 1673-1681.

Taggart, C.T., P. Penney, N. Barrowman and C. George 1995. The 1954-1993 Newfoundland cod-tagging database: statistical summaries and spatial-temporal distributions. *Can. Tech. Rep. Fis. and Aquat. Sci.* 2042.

Templeman, W. 1937. Egg-laying and hatching postures and habits of the American lobster (*Homarus americanus*). *Journal of the Biology Board of Canada* 3: 339-342.

Tremblay, J., D. Pezzack, C. Denton, A. Reeves, S. Smith, A. Silva, and J. Allard 2011. Framework for Assessing Lobster off the Coast of Eastern Cape Breton and Eastern and South Shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Res. Doc 2011/058: viii + 180 p.

Tremblay, M.J., D.S. Pezzack, and J. Gaudette 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. Iv + 18 p.

Tremblay, M.J., Pezzack, D.S., Gaudette, J., Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (*Homarus americanus*) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078: viii + 125 p.

Uzmann, J.R., Cooper, R.A., and Pecci, K.J. 1977. Migration and dispersion of tagged American lobster, *Homarus americanus*, on the southern New England continental shelf. NOAA Tech. rep. Natl. mar. Fish. Serv. No. SSRF-705. U.S. Department of Commerce, Washington, D.C.

Waddy, S.L., Aiken, D.E. and deKleijn, D.P.V. 1995. Control of growth and reproduction In The biology of the lobster. Edited by J. Factor. Pgs 217-266. Academic Press.

Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.

Watson, WH III, W. Golet, D. Scopel, S.Jury. 2009. Use of ultrasonic telemetry to determine the area of bait influence and trapping area of American lobster, *Homarus americanus*, traps. *New Zealand Journal of Marine and Freshwater Research* 43 (1): 411-418.

White, A.L., R.I. Perry, M.A. Koops, R.G. Randall, A. Bundy, P. Lawton, M. Koen-Alonso, D. Masson, P.S. Galbraith, M. Lebeuf, M. Lanteigne, and C. Hoover 2013. A National Synthesis of the Fisheries and Oceans Ecosystem Research Initiative. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/027. v + 31 p.

Worcester, T. and M. Parker 2010. Ecosystem Status and Trends Report for the Gulf of Maine and Scotian Shelf. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/070. vi + 59 p.

Xu, C., Shneider, D.C. 2012. Efficacy of conservation measures for the American lobster: reproductive value as a criterion. *ICES Journal of Marine Science* 69: 1831-1839.

List of websites

Fisheries and Oceans Canada (DFO)
<http://www.dfo-mpo.gc.ca>

DFO – DFO landings statistics
<http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritime-eng.htm>

DFO – Atlantic Lobster Sustainability Measures (ALSM) program
<http://www.dfo-mpo.gc.ca/fm-gp/pesca-pesches/fish-ren-peche/lobster-homard/alsm-mdih-eng.htm>

DFO – Species at Risk
<http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm>

The Government of Prince Edward Island – Department of Fisheries, Aquaculture and Rural Development
<http://www.gov.pe.ca/fard/>

FAO species fact sheet
<http://www.fao.org/fishery/species/3482/en>

St. Lawrence Global Observatory – American Lobster
<http://slgo.ca/en/lobster/context.html>

CITES
<http://www.cites.org/eng/resources/pub/checklist11/Appendices.pdf>

Appendices

Appendix 1 Scoring and Rationales

Appendix 1.1 Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1

UoC 1

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/N)	(Y/N)	(Y/N)			
Justification		RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.					
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)	(Y/N)			
Justification		RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.					
References	<p>Comeau, M., J.M. Hanson, A. Rondeau, M. Mallet, and J. Chassé. 2008. Framework and Assessment for American Lobster, <i>Homarus americanus</i>, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Canadian Science Advisory Secretariat, Research Document 2008/054.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p> <p>Emond, K, Sainte-Marie, B. & Gendron L. 2010. Relative growth, life history phases and sexual maturity of American Lobster, <i>Homarus americanus</i>. Can. J. Zool. 88: 347-358.</p> <p>MacMillan R., M. Comeau, & M. Mallet. 2010. Protecting window-size female American lobster, <i>Homarus americanus</i>, to increase egg production. New Zealand Journal of Marine and Freshwater Research, 43 (1) : 525-536.</p> <p>Steneck, R.S., Vavrinec, J., Leland, A.V. 2004. Accelerating Trophic-level Dysfunction in Kelp Forest Ecosystem of the Western North Atlantic. Ecosystems 7: 323-332.</p> <p>Watson, WH III, W. Golet, D. Scopel, S.Jury. 2009. Use of ultrasonic telemetry to determine the area of bait influence and trapping area of American lobster, <i>Homarus americanus</i>, traps. New Zealand Journal of Marine and Freshwater Research 43 (1): 411-418.</p>						

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
	Xu, C., Schneider, D.C. 2012. Efficacy of conservation measures for the American Lobster: reproductive value as a criterion. ICES Journal of Marine Science 69: 1831-1839.		
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Target reference point	[e.g. Bmsy]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/Bmsy=0.9]
Limit reference point	[e.g. Blim]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/Blim=1.8]
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

UoC 2

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/N)	(Y/N)	(Y/N)
		RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.		
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)	(Y/N)

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	
	Justification	RBF used for scoring, see Tables 1.2.1 (SICA) and 1.2.2 (PSA) in Appendix 1.2.	
		<p>Allard, J., R.R. Claytor, and M.J. Tremblay. 2012. Temperature-corrected abundance index of sub-legal lobsters in LFA 33 – 1999-2000 to 2008-2009. DFO Canadian Science Advisory Secretariat Research Document 2012/048. ii + 17 p.</p> <p>DFO 2011b. Assessment of lobster off the Atlantic coast of Nova Scotia (LFAs 27-33). Canadian Science Advisory Secretariat Science Advisory Report 2011/064.</p> <p>Tremblay, M.J., Pezzack, D.S., Denton, C., Cassista-Da Ros, M., Smith, S.J., Reeves, A.R., Silva, A., and Armsworthy, S. 2012. Assessment of lobster off the coast of eastern Cape Breton and the eastern and south shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/022. iv + 114 p.</p> <p>Emond, K, Sainte-Marie, B. & Gendron L. 2010. Relative growth, life history phases and sexual maturity of American Lobster, <i>Homarus americanus</i>. Can. J. Zool. 88: 347-358.</p> <p>MacMillan R., M. Comeau, & M. Mallet. 2009. Protecting window-size female American lobster, <i>Homarus americanus</i>, to increase egg production. New Zealand Journal of Marine and Freshwater Research, 43 (1): 525-536.</p> <p>Steneck, R.S., Vavrinec, J., Leland, A.V. 2004. Accelerating Trophic-level Dysfunction in Kelp Forest Ecosystem of the Western North Atlantic. Ecosystems 7: 323-332.</p> <p>Tremblay, J., D. Pezzack, C. Denton, A. Reeves, S. Smith, A. Silva, and J. Allard. 2011. Framework for Assessing Lobster off the Coast of Eastern Cape Breton and the Eastern and South Shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Res. Doc. 2011/058: viii + 180 p.</p> <p>Watson, WH III, W. Golet, D. Scopel, S. Jury. 2009. Use of ultrasonic telemetry to determine the area of bait influence and trapping area of American lobster, <i>Homarus americanus</i>, traps. New Zealand Journal of Marine and Freshwater Research 43 (1): 411-418.</p> <p>Xu, C., Schneider, D.C. 2012. Efficacy of conservation measures for the American Lobster: reproductive value as a criterion. ICES Journal of Marine Science 69: 1831-1839.</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	[e.g. Bmsy]	[Include value specifying units. e.g. 100,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/Bmsy=0.9]
Limit reference point	[e.g. Blim]	[Include value specifying units. e.g. 50,000t total stock biomass]	[Include current stock status in the same units as the reference point e.g. 90,000/Blim=1.8]
OVERALL PERFORMANCE INDICATOR SCORE:			85.9

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	
CONDITION NUMBER (if relevant):		NA

UoC 3

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/N)	(Y/N)	(Y/N)
	Justification	RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.		
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)	(Y/N)
	Justification	RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.		

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing
References	<p>DFO 2013d. Assessment of lobster (<i>Homarus americanus</i>) in lobster fishing area (LFA) 34. Canadian Science Advisory Secretariat Science Advisory Report 2013/024.</p> <p>Emond, K, Sainte-Marie, B. & Gendron L. 2010. Relative growth, life history phases and sexual maturity of American Lobster, <i>Homarus americanus</i>. Can. J. Zool. 88: 347-358.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p> <p>Steneck, R.S., Vavrinec, J., Leland, A.V. 2004. Accelerating Trophic-level Dysfunction in Kelp Forest Ecosystem of the Western North Atlantic. Ecosystems 7: 323-332.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J. , Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p> <p>Watson, WH III, W. Golet, D. Scopel, S. Jury. 2009. Use of ultrasonic telemetry to determine the area of bait influence and trapping area of American lobster, <i>Homarus americanus</i>, traps. New Zealand Journal of Marine and Freshwater Research 43 (1): 411-418.</p>
	OVERALL PERFORMANCE INDICATOR SCORE: 85.9
	CONDITION NUMBER (if relevant): NA

UoC 4

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.
	Met?	(Y/N)	(Y/N)
Justification	RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.		

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
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)	(Y/N)	
Justification	RBF used for scoring, see Tables 1.2.1 (SICA) AND 1.2.2 (PSA) in Appendix 1.2.			
References	<p>DFO 2013e. Assessment of lobster (<i>Homarus americanus</i>) in lobster fishing areas (LFA) 35-38. Canadian Science Advisory Secretariat Science Advisory Report 2013/023.</p> <p>Emond, K, Sainte-Marie, B. & Gendron L. 2010. Relative growth, life history phases and sexual maturity of American Lobster, <i>Homarus americanus</i>. Can. J. Zool. 88: 347-358.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p> <p>Steneck, R.S., Vavrinec, J., Leland, A.V. 2004. Accelerating Trophic-level Dysfunction in Kelp Forest Ecosystem of the Western North Atlantic. Ecosystems 7: 323-332.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J. , Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p> <p>Watson, WH III, W. Golet, D. Scopel, S.Jury. 2009. Use of ultrasonic telemetry to determine the area of bait influence and trapping area of American lobster, <i>Homarus americanus</i>, traps. New Zealand Journal of Marine and Freshwater Research 43 (1): 411-418.</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				85.9
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.1.2 (For all 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?	(Y/N)	(Y/N)	
	Justification	Default score of 80 as RBF used for PI 1.1.1 Stock Status.		
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)	(Y/N)
	Justification	Default score of 80 as RBF used for PI 1.1.1 Stock Status.		
c	Guidepost		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.	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.
	Met?		(Y/N)	(Y/N)
	Justification	Default score of 80 as RBF used for PI 1.1.1 Stock Status.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Justification	Met?		Not relevant	
References		<p>DFO 2014b. Reference points options for the southern Gulf of St. Lawrence lobster stock. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/nnn.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>Fogarty, M.J. and L. Gendron 2004. Biological reference points for American lobster (<i>Homarus americanus</i>) populations: limits to exploitation and the precautionary approach. Canadian Journal of Fisheries and Aquatic Science 61: 1392-1403.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.1.3 (For all 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?	(Y/N)		(Y/N)
	Justification	Lobster stock is not depleted.		
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?	(Y/N)	(Y/N)	(Y/N)
	Justification	Lobster stock is not depleted.		
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?	(Y/N)	(Y/N)	
	Justification	Lobster stock is not depleted.		

PI 1.1.3	Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe
References	<p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p> <p>DFO 2011b. Assessment of lobster off the Atlantic coast of Nova Scotia (LFAs 27-33). Canadian Science Advisory Secretariat Science Advisory Report 2011/064.</p> <p>Tremblay, J., D. Pezzack, C. Denton, A. Reeves, S. Smith, A. Silva, and J. Allard. 2011. Framework for Assessing Lobster off the Coast of Eastern Cape Breton and the Eastern and South Shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Res. Doc. 2011/058: viii + 180 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Denton, C., Cassista-Da Ros, M., Smith, S.J., Reeves, A.R., Silva, A., and Armsworthy, S. 2012. Assessment of lobster off the coast of eastern Cape Breton and the eastern and south shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Canadian Science Advisory Secretariat Research Document 2012/022. iv + 114 p.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	NS
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 1.2.1

UoC 1

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

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification			
	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. A multiyear integrated management plan was implemented in 1999, in order to address 1995 FRCC's recommendation. The long term objectives were to ensure the continued sustainability of the lobster fishery by implementing a precautionary approach to conservation of the resource. Management objectives were to raise lobster egg production to at least twice the current level and to move toward uniform carapace size throughout the SGSL. Even if the objective of doubling egg production per recruit is not a reference point in the sense of a PA, it was used as a reference to assess the effectiveness of conservation plans requested by the DFO Minister in 1997. To achieve the target of doubling the egg production, the harvest strategy resulted in a progressive increase of the carapace size. The harvest strategy was adjusted over time. It was revised in 2004 to further increase the minimum legal size, which reaches or exceeds, at present, the size at 50% maturity (72 mm). A "window size" for females (no catch in the range of 115-129 mm) was introduced in 2003. In reaction of the 2007 FRCC's report, and considering the ongoing risk of recruitment failure, the intent was also to work with the industry to reduce fishing effort. As a result, a reduction of nominal effort was implemented. The total fishing licenses went from 1924, in 2008, to 1702, in 2012. The number of traps per license was also reduced in areas 26A1 (from 300 to 280), 26A2 (300 to 275), 26A3 and 26B (300 to 250). It is unclear if this reduction was effective to reduce the exploitation rates, it is, however, an attempt to do so. The harvest strategy defined in 1999 intended to respond to the state of the stock. The strategy was designed and implemented to achieve the target of doubling the egg production. The objective was reached, as recognized by the FRCC in 2007. Considering that the reference point was doubling egg production, it is possible to say that the harvest strategy is designed to achieve stock management objectives reflected in the target and limit reference points. Therefore, the elements 60a, 80a are met. In 2009, DFO adopted a Precautionary Approach Framework, which required to define Limit Reference Points and Upper Stock Reference Point. A set of references points, based on landings, was peer-reviewed and accepted. It is obviously premature to anticipate the efficiency of this new approach. However, this approach is similar to the approaches defined for other lobster stocks (Magdalen Islands, Gaspésie). The harvest strategy was adjusted in response to the state of the stock and clear limits and reference points were set. A harvest strategy is in place and has shown to be responsible to the state of the stock. The strategy was designed and implemented to initially achieve the target of doubling the egg production, and in the recent years to maintain a the high reproductive capacity of the stock. Therefore, SG 100a is met.			
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	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	<p>The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</p> <p>In 2007, FRCC evaluated the effect of its 1995 recommendations. LFAs have increased egg production by more than 50%. FRCC related that result by the increase of the minimum legal size. Since that 2007 report, carapace size has reached or exceeded the size at 50% maturity, which is expected to enhance egg production.</p> <p>Landings have increased, as well as the abundance of berried females. Trends of recruitment indices are positive.</p> <p>It appears that the strategy has worked based on scientific data and on the FRCC's evaluation. However the there is no analytical tool to quantify exact removal associated with a given management measures as for the moment, stock's response to a given management measure can only be described in empirical term.</p> <p>SG 60 and 80 are met, as evidence exists that the strategy is achieving its objectives (increasing egg production). However, the strategy has not been fully evaluated and the SG100 is not met.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Monitoring is in place that is expected to determine whether the harvest strategy is working. The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production, derived from fishery-dependent and fishery-independent data. The fishery-dependent data include DFO official catch statistics, at-sea sampling activities (1983-present: LFAs 26AD and 25S; 1983-2004 and 2012: LFAs 23 and 26B; 1983-2000, 2003, 2012: LFA 26ANS, and voluntary recruitment-index program (2006-present LFAs 25S and 26AD). The fishery-independent data consist of a trawl survey conducted in LFA 25 and part of LFA 26A (2001-2009, 2012), SCUBA survey indices from LFAs 23A (2009-present), 23B (2003-present), 25S (2005-present), and occasionally in other areas (23D, 26A1, 26A3), and bio-collectors (2008-2012 LFA 26BS, and occasionally in other areas).		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	The global performance of the fishery is evaluated every three years through the Regional Advisory Process. However, the harvest strategy of increasing egg production was not reviewed since the 2007 FRCC's report. It is not possible to say that the strategy is formally reviewed periodically. Therefore the SG100 is not met.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
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>DFO 2008. Framework and Assessment for the American Lobster, <i>Homarus americanus</i>, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.</p> <p>DFO. 1989. Integrated Fisheries Management Plan. Lobster in the Southern Gulf Lobster Fishing Areas 23, 24, 25, 26A, 26B 1998 – 2001. DFO Gulf Region Fisheries Management Plan G8/1.</p> <p>DFO. 2004. 2004 Lobster Management Plan for LFA'S 23, 24, 26A, and 26B Southern Gulf of St. Lawrence.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				NA

UoC 2

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>A Canadian strategy for Atlantic lobster was launched in response to the 1995 FRCC's report, which outlined the critical situation of lobster stocks in Atlantic Canada. The objective was then to double egg production. FRCC revised Lobster status in 2007 and made further recommendations to reduce fishing mortality.</p> <p>The 2011 Integrated Fisheries Management Plan has proposed explicit strategies for the key pressures imposed by the inshore lobster fishery, to address the productivity issue: keep lobster fishing mortality moderate; keep fishing mortality moderate for by-catch species, <i>i.e.</i> Jonah crab, rock crab; allow sufficient escapement from exploitation for spawning; limit disturbing activity during important reproductive seasons.</p> <p>Reference points, based on landings, were proposed and peer reviewed in 2012.</p> <p>According to those strategies, changes in management occurred since 1998 in LFAs 27-33. The major change was an increase in the MLS: LFA 27 from 70 to 76 mm CL (1998-2002) and from 76 to 81 mm CL (2007-2009), in reaction to FRCC's report; LFAs 28-29 from 81 to 84 mm (1995-2009); LFAs 30-33 from 81 to 82.5 mm (1995-2009). Other measures were progressively implemented: release of females at 135mm maximum CL, 114-124mm in LFA 30 and 31A respectively, maximum entrance hoop (153 mm, LFAs 28-29), active voluntary V-notching program.</p> <p>As a result, the various stock indicators show a positive trend and landings are now more than twice the proposed Upper Reference Points. The calculated exploitation rate in recent years is below the median (30% in area 27) of the period 1999-2007.</p> <p>A harvest strategy exists. It was revised and adjusted to the state of the stocks (FRCC's reports, IFMP, reference points). That strategy achieved the objectives to improve stock production and biomass. Both SG 60 and 80 are met.</p> <p>The IFMP was adopted in 2011. It is explicitly designed to achieve the objective of conserving productivity is currently of the Maritimes Region inshore lobster fishery.</p> <p>Therefore, SG 100 is met.</p>			
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	N	

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	<p>The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</p> <p>After the 1995 FRCC's report, MLS was increased and other measures were implemented to improve stock productivity. At present, between 70% and 100% of sublegal mature females are protected. Landings and CPUEs have increased, as well as the abundance of berried females. Trends of recruitment indices are positive.</p> <p>It appears that the strategy has worked based on scientific data. However the there is no analytical tool to quantify exact removal associated with a given management measures as for the moment, stock's response to a given management measure can only be described in empirical term.</p> <p>SG 60 and 80 are met, as evidence exists that the strategy is achieving its objectives (enhancing stock productivity).</p> <p>However, the strategy has not been fully evaluated, so the SG100 is not met.</p>		
C	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Monitoring is in place that is expected to determine whether the harvest strategy is working. Various data are available: at-sea and shore sampling, voluntary and compulsory log-books, FSRS recruitment traps program. Size composition of catches, abundance of pre-recruits and berried females are thus available. It is therefore possible to monitor the current stock productivity status, and SG 60 is met.		
D	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	The global performance of the fishery is evaluated through the Regional Advisory Process. However, the harvest strategy was not reviewed since the 2007 FRCC's report. It is not possible to say that the strategy is formally reviewed periodically. Therefore the SG100 is not met.		
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

PI 1.2.1		There is a robust and precautionary harvest strategy in place	
	Justification		
References		DFO 2011a. Inshore Lobster Integrated Fishery Management Plan Lobster Fishing Areas 27 – 38 Scotia-Fundy Sector. Maritimes Region 2011. FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices. FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices. Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. Iv + 18 p.	
OVERALL PERFORMANCE INDICATOR SCORE:		85	
CONDITION NUMBER (if relevant):		NA	

UoC 3

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

PI 1.2.1		There is a robust and precautionary harvest strategy in place			
	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>A Canadian strategy for Atlantic lobster was launched in response to the 1995 FRCC's report, which outlined the critical situation of lobster stocks in Atlantic Canada. The objective was then to double egg production. FRCC revised Lobster status in 2007 and made further recommendations to reduce fishing mortality. In response, the minimum legal size was raised from 81 to 82.5 mm.</p> <p>The 2011 IFMP has proposed the overall objective to prevent causing unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem. Productivity is currently the primary conservation objective for the Maritimes Region inshore lobster fishery. Explicit strategies have been developed for the key pressures imposed by the inshore lobster fishery, as follows: keep lobster fishing mortality moderate; keep fishing mortality moderate for by-catch species, <i>i.e.</i> Jonah crab, rock crab; allow sufficient escapement from exploitation for spawning ; limit disturbing activity during important reproductive seasons.</p> <p>The IFMP also suggest potential responses to decreasing stock abundance. These responses could include but will not be limited to changes in or introduction of: size and sex controls (minimum size, window size, maximum size, v-notching); effort controls (trap numbers, gear design, season, licence number); area controls (closed areas); landing controls (landings cap). Those potential actions are still under discussion and are not formally included in the harvest control rules.</p> <p>A precautionary approach proposed for lobster in LFA 34 utilizes reference points for the abundance of legal sizes (80% of the median of lobster landings from 1985-2009; 80% of the median commercial CPUE for the period 1998-99 to 2008-09) and the abundance of legal and sublegal sizes combined (ITQ survey).</p> <p>Landings-based reference points: the Upper Stock Reference (USR) is 8,867 t. The 3-year running mean of landings is 21,147 t for the season ending 2011-12, well above this USR.</p> <p>A proposed USR based on commercial CPUE: the current 3-year running mean (1.0 kg/trap haul) is well above the USR (0.62 kg/trap haul).</p> <p>A proposed fishery independent USR for legal and sublegal lobster abundance is 80% of the median catch rate in the ITQ survey for the period 1996-2009. The current 3-year running mean (71.9) is well above the USR (19.0 lobsters per tow).</p> <p>These indicators are above their Upper References (USR), indicating that the lobster stock in LFA 34 is in the healthy zone</p> <p>A harvest strategy exists. It was revised and adjusted to the state of the stocks (FRCC's reports, IFMP, reference points), That strategy achieved the objectives to protect stock production and biomass. Both SG 60 and 80 are met.</p> <p>The IFMP was adopted in 2011. It is explicitly designed to achieve the objective of conserving productivity is currently of the Maritimes Region inshore lobster fishery.</p> <p>Therefore SG100 is met.</p>			
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	N	

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	<p>After the 1995 and the 2007 FRCC's reports, MLS was increased. Exploitation rates are calculated with the change in ratio technique and from a length based cohort analysis. Both techniques indicate an exploitation rate high but stable around 80%, since 2000. According to the 2013 Science Advisory Report, in the nearshore portion of LFA 34, exploitation rate has remained high for decades but have not inhibited the substantial increases in lobster abundance in the last 10-12 years. Given that environmental conditions remain favorable for lobster, the current levels of fishing effort do not appear to threaten the sustainability of lobster stocks in LFA 34.</p> <p>Landings are constantly above 15,000 t since 2000, and, in the season 2011-2012, they were the highest of the time series (23,292 t).</p> <p>The average commercial CPUE of the last two years (1.1 kg/trap haul) is 1.7 times that of 1998-99 and 1999-00 (0.6-0.7 kg/trap/haul). This increase in CPUE accounts for the increased landings over the same time period.</p> <p>It appears that the strategy has worked based on scientific data. The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives to conserve stock production, meeting both 60 and 80 SG's requirements.</p> <p>However the there is no analytical tool to quantify exact removal associated with a given management measures as for the moment, stock's response to a given management measure can only be described in empirical term.</p> <p>The strategy has not been fully evaluated, preventing the fishery to meet SG100.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Various data are available: at-sea and shore sampling, log-books, FSRS recruitment traps program. Size composition of catches, and indicators abundance of legal lobster pre-recruits are thus available. It is therefore possible to monitor the current stock productivity status. Monitoring is in place that is expected to determine whether the harvest strategy is working, so SG60 is met		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	The global performance of the fishery is evaluated through the Regional Advisory Process. However, the harvest strategy was not reviewed since the 2007 FRCC's report. It is not possible to say that the strategy is formally reviewed periodically. Therefore the SG100 is not met.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
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>DFO 2011a. Inshore Lobster Integrated Fishery Management Plan Lobster Fishing Areas 27 – 38 Scotia-Fundy Sector. Maritimes Region 2011.</p> <p>DFO. 2013. Assessment of lobster (<i>Homarus americanus</i>) in lobster fishing area (LFA) 34. Canadian Science Advisory Secretariat Science Advisory Report 2013/024.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J. , Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				NA

UoC 4

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

PI 1.2.1		There is a robust and precautionary harvest strategy in place			
	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>A Canadian strategy for Atlantic lobster was launched in response to the 1995 FRCC's report, which outlined the critical situation of lobster stocks in Atlantic Canada. The objective was then to double egg production. FRCC revised lobster status in 2007 and made further recommendations to reduce fishing mortality. In response, the minimum legal size was raised from 81 to 82.5 mm.</p> <p>The 2011 IFMP has proposed the overall objective to prevent causing unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem. Productivity is currently the primary conservation objective for the Maritimes Region inshore lobster fishery. Explicit strategies have been developed for the key pressures imposed by the inshore lobster fishery, as follows: keep lobster fishing mortality moderate; keep fishing mortality moderate for by-catch species, <i>i.e.</i> Jonah crab, rock crab; allow sufficient escapement from exploitation for spawning; limit disturbing activity during important reproductive seasons. The IFMP also suggest potential responses to decreasing stock abundance. These responses could include but will not be limited to changes in or introduction of: size and sex controls (minimum size, window size, maximum size, v-notching); effort controls (trap numbers, gear design, season, licence number); area controls (closed areas); landing controls (landings cap). Those potential actions are still under discussion and are not formally included in the harvest control rules.</p> <p>A precautionary approach proposed for lobster for the Bay of Fundy utilizes reference points for the abundance of legal sizes (landings, commercial catch rate), and legal and sublegal sizes (summer RV catch rate).</p> <p>Landings-based reference points for the abundance of legal size lobsters are based on the median of the lobster landings from 1985-2009. For the upper stock reference (USR) and limit reference point (LRP), the values of 80% and 40% were used. The proposed USR is 1,575 t. The 3-year running mean is 6,936 t for the season ending 2011-12, putting these LFAs in the healthy zone, well above this USR.</p> <p>For the commercial CPUE, it is proposed that 50% of the median CPUE from the start of the CPUE series (2005-06) to 2008-09 ($=0.58 \text{ kg/trap haul}$) be used as a basis for the USR. The current 3-year mean (1.6 kg/trap haul) is well above the proposed USR.</p> <p>A fishery independent USR is proposed for legal and sublegal lobster abundance in the Bay of Fundy based on 80% of the median catch rate in the summer RV surveys for the period 1985-2009 (1.9 lobsters per tow). The 3-year running mean as of 2012 was 25.7 lobsters per tow, which is well above the proposed USR.</p> <p>These indicators are above their Upper Stock References (USR), indicating that the lobster stock in LFAs 35-38 is in the healthy zone.</p> <p>A harvest strategy exists. It was revised and adjusted to the state of the stocks (FRCC's reports, IFMP, reference points). That strategy achieved the objectives to protect stock production and biomass. Both SG 60 and 80 are met.</p> <p>The IFMP was adopted in 2011. It is explicitly designed to achieve the objective of conserving productivity is currently of the Maritimes Region inshore lobster fishery. Therefore, SG100 is met.</p>			
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	N	

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		<p>After the 1995 and the 2007 FRCC's reports, MLS was increased from 81 to 82.5 mm. Exploitation rates are calculated with the change in ratio technique. The time series is short (1-3 years), and the model is poorly reliable, but it indicates an exploitation rate of 0.68 for the males and 0.77 for the females (lower than in LFA 34). The model only includes lobsters in the size range 82-90 mm, and does not take into account the larger fraction of the size distribution.</p> <p>According to the Science Advisory Report, given that the environmental conditions remain favorable for lobster, the current levels of fishing effort do not appear to threaten the sustainability of lobster stocks in LFAs 35-38.</p> <p>All the indicators of stock status (landings, CPUEs, surveys) are well above the Upper Reference Points proposed in the precautionary approach. They are also the highest in the last decade.</p> <p>It appears that the strategy has worked based on scientific data. The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives to conserve stock production, meeting both SG60 and SG80 requirements.</p> <p>However there is no analytical tool to quantify exact removal associated with a given management measures as for the moment, stock's response to a given management measure can only be described in empirical term.</p> <p>The strategy has not been fully evaluated preventing SG100 to be met.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	<p>Various data are available: at-sea and shore sampling, log-books, FSRS recruitment traps program. Size composition of catches, and indicators abundance of legal lobster pre-recruits are thus available. It is therefore possible to monitor the current stock productivity status.</p> <p>Monitoring is in place that is expected to determine whether the harvest strategy is working, so SG60 is met</p>		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	<p>The global performance of the fishery is evaluated through the Regional Advisory Process. However, the harvest strategy was not reviewed since the 2007 FRCC's report. It is not possible to say that the strategy is formally reviewed periodically. Therefore the SG100 is not 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.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Justification	Met?	Not relevant	Not relevant	Not relevant
References	<p>DFO 2011a. Inshore Lobster Integrated Fishery Management Plan Lobster Fishing Areas 27 – 38 Scotia-Fundy Sector. Maritimes Region 2011.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J. , Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.2.2

UoC 1

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	N	
Justification		<p>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.</p> <p>General understood harvest rules are in place: minimum legal size, mandatory release of berried females and females in the window size, escape vent, prohibition of fishing on Sundays. Those rules are consistent with the harvest strategy. Even if the landings are at the highest in the history, fishing pressure has also declined, due to the reduction of nominal fishing effort and the increase of the minimum legal size. The SG60 is met.</p> <p>Those rules are not well defined in relation with a harvest strategy.</p> <p>New reference points were accepted in 2014, based on landings. Those points define the upper reference point (above which the stock can be considered as healthy) and a lower reference point (below which the stock is endangered). Landings from 2011 indicate that the stock is in the healthy zone, above both the USR and B_{MSY} values.</p> <p>At present no well-defined harvest control rules exist to adjust those management measures when reference points are approached. Therefore SG80 is not met.</p>		
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?		N	N
Justification		At present no well-defined harvest control rules exist to adjust management measures when reference points are approached. Therefore neither SG80 nor SG100 is met.		
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	N

PI 1.2.2		There are well defined and effective harvest control rules in place
	Justification	<p>Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>Harvest control rules include a fixed number of licenses, a maximum number of traps per license, a maximum trap size, escape vent, fixed fishing season and prohibition to fish on Sundays. Exploitation is well controlled, the fishery meeting SG60.</p> <p>In order to achieve the objectives defined in the harvest strategy, fishing pressure was reduced with the diminution of the nominal fishing effort. The effort of reducing fishing pressure was done even if the various biological indicators show that the stock is healthy, under the new reference points (landings above the Upper Reference Limit) and that the trends are positive. The objective of increasing egg production was reached.</p> <p>The tools have demonstrated to be effective to achieve the targets defined in the harvest strategy and in the newly defined precautionary approach. Therefore, SG80 is met.</p>
	References	<p>DFO 2008. Framework and Assessment for the American Lobster, <i>Homarus americanus</i>, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.</p> <p>DFO. 1989. Integrated Fisheries Management Plan. Lobster in the Southern Gulf Lobster Fishing Areas 23, 24, 25, 26A, 26B 1998 – 2001. DFO Gulf Region Fisheries Management Plan G8/1.</p> <p>DFO. 2004. 2004 Lobster Management Plan for LFA'S 23, 24, 26A, and 26B Southern Gulf of St. Lawrence.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p> <p>DFO 2014b. Reference points options for the southern Gulf of St. Lawrence lobster stock. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/nnn.</p> <p>FRCC (Fisheries Resource Conservation Council) 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council) 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		65
CONDITION NUMBER (if relevant):		1

UoCs 2, 3 and 4

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	N		
b	Justification	<p>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.</p> <p>General understood harvest rules are in place: fixed number of licenses, a maximum number of traps per license, minimum legal size, mandatory release of v-notched and berried females, escape vent. The landings are at the highest in the history, as well as standardized CPUEs, both for legal and sublegal lobsters. Those rules are consistent with the harvest strategy which aims at maintaining the productivity of the stock. The SG60 is met.</p> <p>Reference points were accepted in 2012, based on landings. Those points define the upper reference point (above which the stock can be considered as healthy) and a lower reference point (below which the stock is endangered).</p> <p>In the concept of the precautionary approach, other reference points were proposed, based on CPUEs and trawl surveys.</p> <p>The IFPM clearly states: "If landing levels reach 80% of the median landing levels the upper stock reference point will be reached and measures will be taken to reduce the removal rate".</p> <p>Even if generic actions, as potential responses to decreasing stock abundance, are suggested in the IFMP, they are not still officially implemented to define clear actions when reference points are approached. Therefore SG80 is not met.</p>			
	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.	
c	Met?		N	N	
	Justification	At present no well-defined harvest control rules exist to adjust management measures when reference points are approached. Therefore neither SG80 nor SG100 is met.			
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.		

PI 1.2.2		There are well defined and effective harvest control rules in place			
Justification	Met?	Y	Y	N	
		<p>Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>Harvest control rules include a fixed number of licenses, a maximum number of traps per license, escape vent, maximum legal size, protection of berried and v-notched females. Landings are accurately monitored through logbooks and sale slips. Exploitation is well controlled and SG60 is met.</p> <p>In order to achieve the objectives defined in the harvest strategy, the MLS was increased. The objective of conserving stock productivity was reached. Both landings and commercial CPUEs are currently the highest in the time series. CPUEs of sublegal lobsters have also increased. The tools have demonstrated to be effective to achieve the targets defined in the harvest strategy and in the newly defined precautionary approach. Therefore, SG80 is met.</p> <p>However, the evidence does not clearly show that the tools are effective, especially to respond to the state of the stock when reference points are approached. Therefore, SG100 is not met.</p>			
References		<p>DFO 2011a. Inshore Lobster Integrated Fishery Management Plan Lobster Fishing Areas 27 – 38 Scotia-Fundy Sector. Maritimes Region 2011.</p> <p>DFO. 2013e. Assessment of lobster (<i>Homarus americanus</i>) in lobster fishing area (LFA) 34. Canadian Science Advisory Secretariat Science Advisory Report 2013/024.</p> <p>FRCC (Fisheries Resource Conservation Council). 1995. A conservation framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. November 1995. 49 p. + appendices.</p> <p>FRCC (Fisheries Resource Conservation Council). 2007. Sustainability framework for Atlantic lobster. Report to the Minister of Fisheries and Oceans. July 2007. 54 p. + appendices.</p> <p>Tremblay, M.J., Pezzack, D.S., and Gaudette, J. 2012. Development of Reference Points for Inshore Lobster in the Maritimes Region (LFAs 27-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/028. iv + 18 p.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J., Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				65	
CONDITION NUMBER (if relevant):				1	

Evaluation Table for PI 1.2.3

UoC 1

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. Fleet composition is well known with the licensing system. A wide range of information is collected on the lobster stock on a yearly basis through various tools: at-sea sampling, index fishermen program, recruitment index program, trawl survey, SCUBA divers survey, larval bio-collectors. Size composition of catches, abundance of pre-recruits and berried females are thus available. Those data allow to provide information on the global trends of the lobster population and to verify if the harvest strategy is reached.</p> <p>However, while the number of indicators is quite high, they are not comprehensive. E.g.: stock abundance estimates rely on indirect indicators (CPUEs, partial trawl survey), and natural fluctuations due to environment is uncertain, preventing the fishery from meeting 100a.</p>		
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	N

PI 1.2.3		Relevant information is collected to support the harvest strategy			
	Justification	<p>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.</p> <p>The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production, derived from fishery-dependent and fishery-independent data. The fishery-dependent data include DFO official catch statistics, at-sea sampling activities (1982-present), and voluntary recruitment-index logbook program (1999-present). The fishery-independent data consist of a trawl survey conducted in LFA 25 and part of LFA 26A (2001-2009, 2012), SCUBA survey indices from LFAs 23A (2009-present), 23B (2003-present), 25S (2005-present), and occasionally in other areas (23D, 26A1, 26A3), and bio-collectors (2008-2012 LFA 26BS, and occasionally in other areas).</p> <p>However, all information required by the harvest control rule is not monitored with high frequency and a high degree of certainty, and there is not a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty. Although it is considered that catch rates reflect lobster abundance on the sea floors, they can also be affected by catchability variations that bring about uncertainty in their interpretation. Changes in catchability can also create uncertainty in the calculation of exploitation rate indices. Spatial fishing patterns can affect the abundance index of berried female if, for example, fishers avoid areas where these female can gather. Predictions for recruitment to the fishery from data benthic deposition are not very accurate because of the variability of age at recruitment and uncertainty as to the survival of lobsters between the time of their benthic settlement and their entry into the fishery 8 to 10 years later. There is also uncertainty as the representativeness of small-scale observations for the entire population.</p>			
c	Guidepost		There is good information on all other fishery removals from the stock.		
	Met?		y		
	Justification	<p>There is good information on all other fishery removals from the stock.</p> <p>Due to condition of licence, lobster should not be retained without a lobster licence and must be released immediate in water. Post capture mortality is recognized to be low and actual removals should be minor.</p> <p>Poaching and illegal fishing is no longer a concern. According to stakeholders and enforcement staff, removals remain minor, due to self-policy, surveillance and heavy penalties.</p>			
References		<p>DFO 2008. Framework and Assessment for the American Lobster, <i>Homarus americanus</i>, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				80	
CONDITION NUMBER (if relevant):				NA	

UoC 2

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	
b	Justification	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. Fleet composition is well known with the licensing system. A wide range of information is collected on the lobster stock on a yearly basis through various tools: at-sea and shore sampling, voluntary and compulsory log-books, FSRS recruitment traps program (which provides data which can be considered as "quasi fishery independent"). Size composition of catches, abundance of pre-recruits and berried females are thus available. Those data allow to provide information on the global trends of the lobster population and to verify if the harvest strategy is working. SG 60a and 80a are met. However, while the number of indicators is quite high, they are not comprehensive. E.g.: stock abundance estimates rely on indirect indicators (CPUEs, partial trawl survey), and natural fluctuations due to environment is uncertain, preventing the fishery from meeting 100a.			
		Met?	Y	Y	N

PI 1.2.3		Relevant information is collected to support the harvest strategy			
		<p>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.</p> <p>The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production, derived from fishery-dependent and “quasi” fishery-independent data. The fishery-dependent data include DFO official catch statistics, at-sea and shore sampling activities, and log-books. The “quasi” fishery-independent data consist of the recruitment traps program, conducted by the Fisheries Scientist Research Society (FSRS). Both SG 60b and 80b are met.</p> <p>However, all information required by the harvest control rule is not monitored with high frequency and a high degree of certainty, and there is not a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty. Although it is considered that catch rates reflect lobster abundance on the sea floors, they can also be affected by catchability variations that bring about uncertainty in their interpretation. Changes in catchability can also create uncertainty in the calculation of exploitation rate indices. Spatial fishing patterns can affect the abundance index of berried female if, for example, fishers avoid areas where these female can gather.</p> <p>SG 100b is not met</p>			
c	Guidepost		There is good information on all other fishery removals from the stock.		
	Met?		y		
	Justification	<p>There is good information on all other fishery removals from the stock.</p> <p>Due to condition of licence, lobster should not be retained without a lobster licence and must be released immediate in water. Post capture mortality is recognized to be low and actual removals should be minor.</p> <p>Poaching and illegal fishing is no longer a concern. According to stakeholders and enforcement staff, removals remain minor, due to self-policy, surveillance and heavy penalties. SG 80c is met.</p>			
References		<p>DFO 2011b. Assessment of lobster off the Atlantic coast of Nova Scotia (LFAs 27-33). Canadian Science Advisory Secretariat Science Advisory Report 2011/064.</p> <p>Tremblay, M.J., Pezzack, D.S., Denton, C., Cassista-Da Ros, M., Smith, S.J., Reeves, A.R., Silva, A., and Armsworthy, S. 2012. Assessment of lobster off the coast of eastern Cape Breton and the eastern and south shores of Nova Scotia (LFAs 27-33). DFO Can. Sci. Advis. Sec. Res. Doc. 2012/022. iv + 114 p.</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				80	
CONDITION NUMBER (if relevant):				NA	

UoC 3

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
b	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>Fleet composition is well known with the licensing system.</p> <p>A wide range of information is collected on the lobster stock on a yearly basis through various tools:</p> <ul style="list-style-type: none"> - Port and at-sea sampling protocols ; - Logbooks ; - FSRS information (recruitment traps) ; - Fishery-independant data: DFOs ecosystem trawl survey, completed annually in summer since 1970; industry trawl survey (the ITQ survey) designed to obtain information on the groundfish abundance; annual survey for scallops. Those sources provide information on: <ul style="list-style-type: none"> - Fishery performance (landings, unstandardized CPUE, effort); - Abundance (legal sizes) (CPUE; available fishery independent); - Abundance of pre-recruits (CPUE; available fishery independent); - Reproduction (spawners, egg production proxies); - Fishing Pressure (effort quantity and spatial distribution, exploitation estimates from change-in-ratio; size-based). <p>Sufficient relevant information related to stock structure, stock productivity and on the global trends of the lobster population allow to verify if the harvest strategy is working. SG60a and 80a are met.</p> <p>However, while the number of indicators is quite high, they are not comprehensive. <i>E.g.:</i> stock abundance estimates rely on indirect indicators (CPUEs, trawl survey), and natural fluctuations due to environment is uncertain, preventing the fishery from meeting 100a.</p>		
	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.
c	Met?	Y	Y	N

PI 1.2.3		Relevant information is collected to support the harvest strategy			
	Justification	<p>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.</p> <p>The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production, derived from fishery-dependent and fishery-independent data. The fishery-dependent data include DFO official catch statistics, at-sea (since 1981) and shore (2005-2006) sampling activities, and log-books(since the season 1998-1999). The fishery-independent data consist of the DFO trawl survey (annual since 1970) and the ITQ trawl survey (annual since 1996); annual scallop survey (starting in 1982) and captures lobsters as a bycatch. The recruitment traps program, conducted by the Fisheries Scientist Research Society (FSRS), which started in 1998, can be considered as a “quasi” fishery-independent survey. Both SG 60b and 80b are met.</p> <p>However, all information required by the harvest control rule is not monitored with high frequency and a high degree of certainty, and there is not a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty. Although it is considered that catch rates reflect lobster abundance on the sea floors, they can also be affected by catchability variations that bring about uncertainty in their interpretation. Changes in catchability can also create uncertainty in the calculation of exploitation rate indices. Spatial fishing patterns can affect the abundance index of berried female if, for example, fishers avoid areas where these female can gather.</p> <p>SG 100b is not met</p>			
c	Guidepost		There is good information on all other fishery removals from the stock.		
	Met?		y		
	Justification	<p>There is good information on all other fishery removals from the stock.</p> <p>From observers data, The estimated number of lobster caught in the scallop fishery represents 0.01% of the lobsters caught in the 2011/2012 LFA 34 lobster fishery and 0.05% of the lobsters caught in the area of LFA 34 corresponding to SFA 29 West. In 2012, it is estimated that 4,302 lobsters were caught during the SFA 29 West scallop fishery; 940 were dead or injured.</p> <p>Other removals of lobster by means other than the commercial fishery are partially documented or undocumented, but, according to DFO scientists, they are thought to be low relative to the commercial fishery. According to data provided during the site visit, lobster landings for crew fish/bait, private sales and unknown buyers was estimated to be between 62 t (2010-2011) and 32 t (2012-2013).</p> <p>Due to condition of licence, lobster should not be retained without a lobster licence and must be released immediate in water. Post capture mortality is recognized to be low and actual removals should be minor.</p> <p>Poaching and illegal fishing is no longer a concern. According to stakeholders and DFO scientists, removals remain minor, due to self-policy, surveillance and penalties.</p> <p>Therefore, SG 80c is met.</p>			

PI 1.2.3		Relevant information is collected to support the harvest strategy	
References		<p>DFO 2013g. Assessment of scallops (<i>Placopecten magellanicus</i>) in scallop fishing area (SFA) 29 West of longitude 65°30'W. Canadian Science Advisory Secretariat Maritimes Region Science Advisory Report 2013/055.</p> <p>DFO 2013d. Assessment of lobster (<i>Homarus americanus</i>) in Lobster Fishing Area (LFA) 34. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/024.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J. , Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80	
CONDITION NUMBER (if relevant):		NA	

UoC 4

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

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	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>Fleet composition is well known with the licensing system.</p> <p>A wide range of information, both fishery dependent and fishery independent, is collected on the lobster stock on a yearly basis through various tools:</p> <ul style="list-style-type: none"> - Historical landings and landings from various sources; effort, catch and location from Lobster Catch and Settlement Reports (logbooks), begun in 2004 and generally adopted by 2005-06; - Samples of the at-sea trap catch to estimate size, sex and reproductive status. - Annual DFO Science summer Research Vessel (RV) survey from 1970-present; - Annual joint DFO/industry groundfish survey (ITQ survey), which records lobster as a bycatch. This is a fixed station bottom trawl survey that began in 1995; - The FSRS recruitment trap project; Begun in LFA 35 in 2006-07. Volunteer fishermen keep daily records of lobster count, size and sex in two standard traps; - Annual survey for scallops, which began in 1982 and captures lobsters as a bycatch. <p>These data allow to track lobster stock performance:</p> <ul style="list-style-type: none"> - Abundance indicators of legal and sublegal lobsters; - Spatial distribution of lobsters; - Reproduction (spawners, egg production proxies); - Fishing Pressure (effort quantity and spatial distribution, exploitation estimates from change-in-ratio; size-based). <p>Sufficient relevant information related to stock structure, stock productivity and on the global trends of the lobster population allow to verify if the harvest strategy is working. SG60a and 80a are met.</p> <p>However, while the number of indicators is quite high, they are not comprehensive. E.g.: stock abundance estimates rely on indirect indicators (CPUEs, trawl survey), and natural fluctuations due to environment is uncertain, preventing the fishery from meeting 100a.</p>		
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	N	

PI 1.2.3		Relevant information is collected to support the harvest strategy		
		<p>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.</p> <p>The lobster stock assessment is based on the analysis of trends of stock indicators including abundance, fishing pressure and production, derived from fishery-dependent and fishery-independent data. The fishery-dependent data include DFO official catch statistics, at-sea (since 1981) and shore (2005-2006) sampling activities, and log-books(since the season 1998-1999). The fishery-independent data consist of the DFO trawl survey (annual since 1970) and the ITQ trawl survey (annual since 1996); annual scallop survey (starting in 1982) and captures lobsters as a bycatch. The recruitment traps program, conducted by the Fisheries Scientist Research Society (FSRS), which started in 1998, can be considered as a "quasi" fishery-independent survey. Both SG 60b and 80b are met.</p> <p>However, all information required by the harvest control rule is not monitored with high frequency and a high degree of certainty, and there is not a good understanding of inherent uncertainties in the information and the robustness of assessment and management to this uncertainty. Although it is considered that catch rates reflect lobster abundance on the sea floors, they can also be affected by catchability variations that bring about uncertainty in their interpretation. Changes in catchability can also create uncertainty in the calculation of exploitation rate indices. Spatial fishing patterns can affect the abundance index of berried female if, for example, fishers avoid areas where these female can gather. SG 100b is not met</p>		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		y	
		<p>There is good information on all other fishery removals from the stock.</p> <p>From observers' data, The estimated weight of lobster caught in the scallop fishery during the period 2003-2009 varied between 36 and 113 t, which represents between 1 and 3% of the total landings. Most of those lobsters are released alive, due to license condition.</p> <p>According to data provided during the site visit, lobster landings for crew fish/bait, private sales and unknown buyers was estimated to be between 62 t (2010-2011) and 32 t (2012-2013).</p> <p>Other removals of lobster by means other than the commercial fishery are partially documented or undocumented, but, according to DFO scientists, they are thought to be low relative to the commercial fishery. Due to condition of licence, lobster should not be retained without a lobster licence and must be released immediate in water. Post capture mortality is recognized to be low and actual removals should be minor.</p> <p>Poaching and illegal fishing is no longer a concern. According to stakeholders and DFO scientists, removals remain minor, due to self-policy, surveillance and penalties.</p> <p>Therefore, SG 80c is met.</p>		

PI 1.2.3	Relevant information is collected to support the harvest strategy
References	<p>DFO 2013g. Assessment of scallops (<i>Placopecten magellanicus</i>) in scallop fishing area (SFA) 29 West of longitude 65°30'W. Canadian Science Advisory Secretariat Maritimes Region Science Advisory Report 2013/055.</p> <p>DFO 2013e. Assessment of lobster (<i>Homarus americanus</i>) in Lobster Fishing Areas (LFA) 35-38. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/023.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J., Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p> <p>Sameoto, J.A and Glass, A. 2012. An Overview of Discards from the Canadian Inshore Scallop Fishery in SFA 28 and SFA 29 West for 2002 to 2009. Can. Tech. Rep. Fish. Aquat. Sci. 2979:vi+39 p.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 1.2.4 (For 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/N)	(Y/N)
Justification		Default 80 RBF used for 1.1.1 Stock status.		
b	Guidepost	The assessment estimates stock status relative to reference points.		
		Met?	(Y/N)	

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	Default 80 RBF used for 1.1.1 Stock status.		
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/N)	(Y/N)	(Y/N)
	Justification	Default 80 RBF used for 1.1.1 Stock status.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			(Y/N)
	Justification	Default 80 RBF used for 1.1.1 Stock status.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		(Y/N)	(Y/N)
	Justification	Default 80 RBF used for 1.1.1 Stock status.		
References		<p>DFO 2008. Framework and Assessment for the American Lobster, <i>Homarus americanus</i>, Fisheries in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.</p> <p>DFO 2011b. Assessment of lobster off the Atlantic coast of Nova Scotia (LFAs 27-33). Canadian Science Advisory Secretariat Science Advisory Report 2011/064.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of</p>		

PI 1.2.4	There is an adequate assessment of the stock status
	<p>St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>DFO 2013(Draft). American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Working Paper 2013/xxx Draft.</p> <p>DFO 2013d. Assessment of lobster (<i>Homarus americanus</i>) in Lobster Fishing Area (LFA) 34. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/024.</p> <p>DFO 2013e. Assessment of lobster (<i>Homarus americanus</i>) in Lobster Fishing Areas (LFA) 35-38. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/023.</p> <p>Tremblay, M.J., Pezzack, D.S., Gaudette, J., Denton, C., Cassista-Da Ros, M., and Allard, J. 2013. Assessment of lobster (<i>Homarus americanus</i>) off southwest Nova Scotia and in the Bay of Fundy (Lobster Fishing Areas 34-38). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/078. viii+125p.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.1.1

UoC 1

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?	Y for rock crab, fall spawning herring N for Canadian mackerel	Y for rock crab, fall spawning herring N for Canadian mackerel	N
	Justification	<p>Under licence conditions, rock crab, cunner and sculpin are allowed to be landed. But in actual fishing practices, male rock crab is the only retained species in this fishery. There is no estimate of total biomass of rock crab in the SGSL, in term of male biomass available to the fishery or estimates of exploitation rates. But according to the last SAR, there is no sign suggesting a negative change in rock crab abundance in the recent years and that harvest levels are causing any major problems for rock crab stock. Rock crab has a high abundance and is widely distributed in the coastal areas of the SGSL. The assessment team considers that rock crab is highly likely to be within biologically based limits.</p> <p>With respect to bait use, according to DFO and lobster harvesters, the main species used as bait in the NB and NS lobster fishery are fall-spawning herring (local fisheries) and Atlantic mackerel (local fisheries and in a small portion from U.S. fisheries). The US mackerel is then not considered as a main retained species. The annual estimated bait use in 2012 was 4,274 t of herring and 1,546 t of mackerel for all combined LFAs.</p> <p>The fall-spawning herring is managed under a two-years SGSL conservation and harvesting plan for 2012-2013 including input and output control measures. As a result of the last stock assessment, the exploitation rate in 2011 was 21% below $F_{0.1}$ reference level of 25% and the 2012 beginning-of-year spawning stock biomass was estimated to be about 183,800 t which is well above B_{USR}. Therefore, the stock is not overfished, and overfishing is not occurring. The assessment team considers that there is a high degree of certainty that fall-spawning herring is within biologically based limits and fluctuating around target reference point.</p> <p>The Canadian Atlantic mackerel fisheries are managed under an IFMP. Mackerel fisheries are input and output controls fisheries. As a result of the last stock assessment, the biomass of the Canadian Atlantic mackerel contingent has been declining since the mid-2000s, reaching a very low value in 2013. The abundance index from the egg survey dropped again from 2002 to reach since 2005 the lowest values of the series, which reflects the collapse of the stock. The relationship between fishing mortality and spawning biomass indicates that the stock is currently in a critical situation. According to the sequential population analysis, this decline in biomass was caused by fishing mortality levels several times higher than the historic sustainable levels. It is likely that the stock is currently overfished and in a situation of recruitment overfishing, preventing the fishery from meeting 60a and 80a for the Canadian mackerel.</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>According to the Guidance for MSC CR GCB 3.2, “<i>The component of P2 may be subject to human impact from sources other than the assessed fishery. For example, retained or bycatch species may be target species in other fisheries...The SGs in P2 are structured to first address the status of the component.</i></p> <ul style="list-style-type: none"> • <i>If the status is low, for whatever reason, then the operative P2 assessment issues is then if the fishery is hindering recovery. This is different to the treatment of target species in P1, where low status would preclude certification irrespective of the cause of that low status. For example if a retained or bycatch species in the assessed fishery is depleted as a result of targeting in other fisheries then the P2 assessment would be based on the impact of the assessed fishery on recovery of depleted species, even if no effort was being made to recover the species in the other fisheries”</i> <p>A small portion of mackerel comes from the U.S. Atlantic mackerel fishery. The U.S. Atlantic mackerel fishery primarily uses mid-water and bottom trawls. The Atlantic mackerel, well-managed and resilient species, is managed by the Mid-Atlantic Fishery Management Council and the NOAA’s National Marine Fisheries Service under a Fishery Management Plan established in 1978. The FMP includes a number of measures to ensure sustainable harvesting including input (limited access program) and output (quotas) controls, reference points, and protection of mackerel Essential Fish Habitats. As a result of the last stock assessment, fishing mortality remains very low (below $F=0.06$) since 1992, and the Atlantic mackerel spawning stock biomass (SSB) is 2.3 million mt for a SSB_{MSY} of 644,000 mt. Therefore, the stock is not overfished, and overfishing is not occurring at this time. However, giving the uncertainties in the stock assessment pointed out in the 2010 TRAC report and the absence of recent stock assessment since 2006, the assessment team cannot consider that the US mackerel stock is highly likely within biologically based limits.</p> <p>Other species, including gaspereau and silversides are used as secondary bait. Gaspereau are harvested by gill, trap, and dip nets, and fisheries are managed under a 2000-2004 IFMP for gaspereau of PEI and a six-year 2007-2012 IFMP for gaspereau of eastern New Brunswick. Gaspereau fisheries are regulated by season, gear, and licence restrictions. The management objective is to maintain harvest at about long-term mean levels. The reference point for SGSL gaspereau is defined on the basis of fishing mortality level which does not exceed the natural mortality rate (equivalent to exploitation rates of 0.33 and 0.39).The silverside fishery is prosecuted using box\trap net and is managed under a 2000-2004 IFMP. Silverside fishery is regulated by season, gear and licence restrictions. There is no estimate of biomass of gaspereau and silversides, but there is no sign of stocks to be depleted. Based on the fisheries characteristics and management, and the biological characteristics of those species, the Assessment team considers that stocks are highly likely to be within biologically based limits.</p> <p>The Assessment team attributes N to 100a as there is a high degree of certainty that only fall-spawning herring are within biologically based limits and fluctuating around target reference point.</p>		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points are defined for fall-spawning herring and US mackerel, but not for rock crab, Canadian mackerel, gaspereau and silversides. Therefore the fishery does not meet 100b.		

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		
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	N		
		<p>As a result of the last stock assessment, it is likely that the Canadian mackerel stock is currently overfished and in a situation of recruitment overfishing.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. The total NB and NS fishing licenses went from 1,954 in 2006 to 1,720 in 2012. Also, the number of traps per license was reduced in areas 26A1 (from 300 to 280), 26A2 (from 300 to 275), 26A3 (from 300 to 250), and 26B North and South (from 300 to 250).</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy of demonstrably effective management measures in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80c.</p>		
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			

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
	Justification	<p>Main retained species are rock crab, SGSL fall-spawning herring, and Canadian mackerel. Stocks of main retrained species are assessed and none of them except the Canadian mackerel are depleted, as shown in scoring issue a.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the Canadian mackerel stock.</p> <p>Other species, including gaspereau and silversides are used as secondary bait. Gaspereau and silversides are targeted by small fisheries. There is no estimate of biomass of gaspereau and silversides, but there is no sign of stocks to be depleted. Based on the fisheries characteristics and management, and the biological characteristics of those species, the Assessment team considers that stocks are highly likely to be within biologically based limits.</p> <p>Therefore the fishery meets 60d.</p>
References		<p>DFO 2001. Gaspereau Maritime Provinces overview. DFO Science Stock Status Report D3-17 (2001).</p> <p>DFO 2007a. Integrated Fisheries Management Plan for the Atlantic Mackerel, effective from 2007.</p> <p>DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.</p> <p>DFO 2012f. Assessment of Atlantic herring in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/014.</p> <p>DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.</p> <p>http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/Herring-Information/Herring-2012-2013-CHP http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2000-2004-Silversides-PEI</p> <p>Information provided by DFO and lobster fishermen during site visit meeting.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		70
CONDITION NUMBER (if relevant):		2

UoCs 2, 3 and 4

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?	Y for rock crab, herring N for Canadian mackerel	Y for rock crab, herring N for Canadian mackerel	N
	Justification	<p>All inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab, rock crab, and sculpin. In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab that is 130 mm and greater in length. However, in actual fishing practices, sculpin is not retained.</p> <p>According to DFO Maritimes, reported green Crab, rock Crab, Jonah Crab, and Unspecified Crab landings retained by the inshore Lobster fishery of LFAs 27-38 for resale between 2010 to present has ranged from 0.8-1.6% of the total combined annual inshore landings for these Crab species reported to DFO Maritimes region over the same time period, with the maximum total annual combined landings of these Crab species between 2010 to present being 698 tonnes (this total is inclusive of all reported sources of inshore Crab landings for these species), which represented less than 1% of total lobster landings.</p> <p>With respect to bait use, according to DFO, lobster harvesters and a study carried out in 2010, the main species used as bait in the NB and NS lobster fishery are herring, Atlantic mackerel and rock crab. Rock crab and herring used as bait come from local fisheries. Mackerel used as bait comes from both Canadian and U.S. Atlantic mackerel fisheries in a small portion. Therefore the US mackerel is not considered as a main retained species. A study examining lobster fishery bait-to-catch ratios in Nova Scotia showed that the estimated amount of bait required to catch each lobster ranged from 185 g (November) to 1455 g (April) for average months during the 2002/03, 2003/04 and 2004/05 fishing seasons. The estimated amount of mackerel, rock crab and herring used as bait in 2012 was 8,153 t, 5,512 t and 7,601 t respectively, for all combined LFAs.</p> <p>The Canadian Atlantic mackerel fisheries are managed under an IFMP. Mackerel fisheries are input and output controls fisheries. As a result of the last stock assessment, the biomass of the Canadian Atlantic mackerel contingent has been declining since the mid-2000s, reaching a very low value in 2013. The abundance index from the egg survey dropped again from 2002 to reach since 2005 the lowest values of the series, which reflects the collapse of the stock. The relationship between fishing mortality and spawning biomass indicates that the stock is currently in a critical situation. According to the sequential population analysis, this decline in biomass was caused by fishing mortality levels several times higher than the historic sustainable levels. It is likely that the stock is currently overfished and in a situation of recruitment overfishing, preventing the fishery</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>from meeting 60a and 80a for the Canadian mackerel.</p> <p>According to the Guidance for MSC CR GCB 3.2, “<i>The component of P2 may be subject to human impact from sources other than the assessed fishery. For example, retained or bycatch species may be target species in other fisheries...The SGs in P2 are structured to first address the status of the component.</i></p> <ul style="list-style-type: none"> • <i>If the status is low, for whatever reason, then the operative P2 assessment issues is then if the fishery is hindering recovery. This is different to the treatment of target species in P1, where low status would preclude certification irrespective of the cause of that low status. For example if a retained or bycatch species in the assessed fishery is depleted as a result of targeting in other fisheries then the P2 assessment would be based on the impact of the assessed fishery on recovery of depleted species, even if no effort was being made to recover the species in the other fisheries”</i> <p>The current level of effort does not appear to have an impact on rock crab resource given the protection of brood stock provided by the MLS (for the directed rock crab fishery) and the mandatory release of female crabs. The assessment team considers that the rock crab stock is highly likely to be within biologically based limits.</p> <p>As a result of the last herring stock assessment, an increase occurred from the lower level observed in 2005-2010 for the SW Nova Scotia/Bay of Fundy spawning component. The overall biomass estimates have increased in 2011 and 2012, however, most of this growth has occurred in Scots Bay. The German Bank SSB fluctuated up in 2011 and down in 2012, representing essentially no change. The three-year moving average increased above the limit reference point in 2010, changed very little in 2011, and increased again in 2012. Therefore the assessment team considers that herring stock is highly likely to be within biologically based limits.</p>		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points are defined for herring and US mackerel, but not for rock crab and Canadian mackerel. Therefore the fishery does not meet 100b.		
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	N	

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>As a result of the last stock assessment, it is likely that the Canadian mackerel stock is currently overfished and in a situation of recruitment overfishing.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. A lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery. The number of traps per licence has been reduced from 275 to 250 in LFAs 27-33.</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy of demonstrably effective management measures in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80c.</p>		
d		Guidepost		
		Met?	Y	
		Justification	<p>Main retained species are rock crab, herring, and Canadian mackerel. Stocks of main retrained species are assessed and none of them except the Canadian mackerel are depleted, as shown in scoring issue a.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the Canadian mackerel stock.</p> <p>Therefore the fishery meets 60d.</p>	
References		<p>DFO 2007a. Integrated Fisheries Management Plan for the Atlantic Mackerel, effective from 2007.</p> <p>DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.</p> <p>DFO 2013f. 2013 Assessment of 4VWX herring. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/045.</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>DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.</p> <p>den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. Can. Tech. Rep. Fish. Aquat. Sci. 2890: vii + 39 p.</p> <p>Harnish L., J.H. Martin Willison, 2008. Efficiency of bait usage in Nova Scotia lobster fishery: a first look. Journal of Cleaner Production (2008), doi:10.1016/j.jclepro.2008.08.005.</p> <p>Robichaud, D.A., and Frail, C. 2006. Development of Jonah crab, <i>Cancer borealis</i>, and rock crab, <i>Cancer irroratus</i>, fisheries in the Bay of Fundy (LFAs 35-38) and off southwest Nova Scotia (LFA 34): from exploratory to commercial status (1995-2004). Can. Manuscr. Rep. Fish. Aquat. Sci. 2775: iii + 48 pp.</p> <p>Information provided by DFO and lobster fishermen during site visit meeting.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	70
CONDITION NUMBER (if relevant):	2

Evaluation Table for PI 2.1.2

UoC 1

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 for rock crab, fall-spawning N for Canadian mackerel	Y for rock crab, fall-spawning herring N for Atlantic mackerel

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>By licence conditions and under actual fishing practices, rock crab is the only retained species in the NB and NS lobster fishery. There is a strategy in place to maintain rock crab at levels which are highly likely to be within biologically based limits. Lobster harvesters are allowed to retain only male rock crab. The amount of rock crab landed by lobster harvesters was incorporated in the assessment of the rock crab stock in the SGSL. The use of larger escape mechanism in lobster traps adjusted to the lobster MLS could reduce the retention of small male rock crabs. In addition, the strategy of fishing effort reduction adopted by DFO would have reduced rock crab catches. The management of the directed rock crab fishery is based on effort control (number of licences, trap allocation, restrictions on gear characteristics, and limited fishing season), with individual catch allocations (except in LFA 24) and by a MLS (DFO 2013c). Female cannot be landed.</p> <p>Formal management strategies are in place in the directed fall-spawning fishery to maintain this species used as bait in the lobster fishery at levels which are highly likely to be within biologically based limits. The fall-spawning herring is managed under a two-year SGSL conservation and harvesting plan for 2012-2013 including input and output control measures.</p> <p>There is a partial strategy in place for the directed Canadian Atlantic mackerel fisheries that is expected to ensure the recovery of the mackerel stock. Canadian Atlantic mackerel fisheries are managed under an IFMP. Mackerel fisheries are input and output controls fisheries. Given the critical situation of the stock, the 2014 TAC, set at 10,000 t, was reduced of 26,000 t compared to 2013. The minimum size was increased from 250 mm to 273 mm.</p> <p>The U.S. Atlantic mackerel is under a Fishery Management Plan established in 1978. The FMP includes a number of measures to ensure sustainable harvesting including input (limited access program) and output (quotas) controls, reference points, and protection of mackerel Essential Fish Habitats. Gaspereau fisheries are managed under a 2000-2004 IFMP for gaspereau of PEI and a six-year 2007-2012 IFMP for gaspereau of eastern New Brunswick. Gaspereau fisheries are regulated by season, gear, and licence restrictions. The management objective is to maintain harvest at about long-term mean levels. The silverside fishery is managed under a 2000-2004 IFMP. Silverside fishery is regulated by season, gear and licence restrictions.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. The total NB and NS fishing licenses went from 1,954 in 2006 to 1,720 in 2012. Also, the number of traps per license was reduced in areas 26A1 (from 300 to 280), 26A2 (from 300 to 275), 26A3 (from 300 to 250), and 26B North and South (from 300 to 250).</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80a and 100a.</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		
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 for rock crab, fall-spawning herring N for Canadian mackerel	N
	Justification	<p>There is some objective basis for confidence that strategies will work, based on evidence from stock assessment results for rock crab and fall-spawning herring used as bait, and from fisheries characteristics and management, and the biological characteristics for secondary bait species. So the fishery meets 60b and 80b for these species.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. The total NB and NS fishing licenses went from 1,954 in 2006 to 1,720 in 2012. Also, the number of traps per license was reduced in areas 26A1 (from 300 to 280), 26A2 (from 300 to 275), 26A3 (from 300 to 250), and 26B North and South (from 300 to 250).</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80b.</p> <p>Also, based on the same evidence, a N was assigned to 100b.</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 for rock crab, fall-spawning herring N for Canadian mackerel	N

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>There is some evidence that strategies are being implemented successfully, based on evidence from stock assessment results for rock crab and fall-spawning herring used as bait, and from fisheries characteristics and management, and the biological characteristics for secondary bait species. So the fishery meets 80c for these species.</p> <p>The assessment team considered that there is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80c for Canadian mackerel.</p> <p>Also, based on the same evidence, a N was assigned to 100C.</p>		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	There is no strategy in place for the Canadian mackerel, preventing the fishery from meeting 100d.		
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>DFO 2001. Gaspereau Maritime Provinces overview. DFO Science Stock Status Report D3-17 (2001).</p> <p>DFO 2007a. Integrated Fisheries Management Plan for the Atlantic Mackerel, effective from 2007.</p> <p>DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.</p> <p>DFO 2012f. Assessment of Atlantic herring in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/014.</p> <p>DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.</p> <p>SGSL herring: http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/Herring-Information/Herring-2012-2013-CHP</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	
	Silversides: http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2000-2004-Silversides-PEI Information provided by DFO and lobster fishermen during site visit meeting.	
OVERALL PERFORMANCE INDICATOR SCORE:		70
CONDITION NUMBER (if relevant):		3

UoC 2, 3 and 4

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	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 for rock crab, herring N for Canadian mackerel	Y for rock crab, herring N for Atlantic mackerel

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>All inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab, rock crab, and sculpin. In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab that is 130 mm and greater in length. However, in actual fishing practices, sculpin is not retained.</p> <p>Formal management strategies are in place in the directed herring fishery to maintain this species used as bait in the lobster fishery at levels which are highly likely to be within biologically based limits. The herring is managed under a Scotia-Fundy IFMP including input and output control measures.</p> <p>There is a partial strategy in place for the directed Canadian Atlantic mackerel fisheries that is expected to ensure the recovery of the mackerel stock. Canadian Atlantic mackerel fisheries are managed under an IFMP. Mackerel fisheries are input and output controls fisheries. Given the critical situation of the stock, the 2014 TAC, set at 10,000 t, was reduced of 26,000 t compared to 2013. The minimum size was increased from 250 mm to 273 mm.</p> <p>The U.S. Atlantic mackerel is under a Fishery Management Plan established in 1978. The FMP includes a number of measures to ensure sustainable harvesting including input (limited access program) and output (quotas) controls, reference points, and protection of mackerel Essential Fish Habitats.</p> <p>The crab fisheries are managed by effort control (input fishery). The current level of effort does not appear to have an impact on rock crab resource given the protection of brood stock provided by the MLS (for the directed rock crab fishery) and the mandatory release of female crabs.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. A lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery. The number of traps per licence has been reduced from 275 to 250 in LFAs 27-33.</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy of demonstrably effective management measures in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80a and 100a.</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		
b	Guidedpost	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 for rock crab, herring N for Canadian mackerel	N
		<p>There is some objective basis for confidence that strategies will work, based on evidence from stock assessment results for rock crab, herring and US mackerel used as bait, and from fisheries characteristics and management. So the fishery meets 60b and 80b for these species.</p> <p>The impact of the lobster fishery on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. A lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery. The number of traps per licence has been reduced from 275 to 250 in LFAs 27-33.</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80b.</p> <p>Also, based on the same evidence, a N was assigned to 100b.</p>		
c	Guidedpost		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 for rock crab, herring N for Canadian mackerel	N

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					
		There is some evidence that strategies are being implemented successfully, based on evidence from stock assessment results for rock crab and herring used as bait, and from fisheries characteristics and management. So the fishery meets 80c for these species. The assessment team considered that there is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting 80c for Canadian mackerel. Based on the same evidence, a N was assigned to 100c.					
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.			
	Met?			N			
	Justification	There is no strategy in place for the Canadian mackerel, preventing the fishery from meeting 100d.					
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	DFO 2007a. Integrated Fisheries Management Plan for the Atlantic Mackerel, effective from 2007. DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031. DFO 2013f. 2013 Assessment of 4VWX herring. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/045. DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030. Robichaud, D.A., and Frail, C. 2006. Development of Jonah crab, <i>Cancer borealis</i> , and rock crab, <i>Cancer irroratus</i> , fisheries in the Bay of Fundy (LFAs 35-38) and off southwest Nova Scotia (LFA 34): from exploratory to commercial status (1995-2004). Can. Manuscr. Rep. Fish. Aquat. Sci. 2775: iii + 48 pp.						
	Information provided by DFO and lobster fishermen during site visit meeting.						

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
OVERALL PERFORMANCE INDICATOR SCORE:	70
CONDITION NUMBER (if relevant):	3

Evaluation Table for PI 2.1.3

UoC 1

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	Y
		<p>By licence conditions and under actual fishing practices, rock crab is the only retained species in the NB and NS lobster fishery. Main species used as bait in the NB and NS fishery are fall spawning herring and Atlantic mackerel. Other species may be used in lower quantity included gaspereau and silversides.</p> <p>Accurate and verifiable information on the catch of all retained species is available and the consequences for the status of affected populations, the fishery meeting 100a. Data on catch of male rock crab caught during the lobster fishery were compiled from sales transactions and other statistics from DFO Fisheries and Aquaculture Management Branch. The amount of rock crab landed by lobster harvesters was incorporated in the assessment of the rock crab stock in the SGSL. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment. The annual estimated bait use in 2012 was 4,274 t of herring and 1,546 t of mackerel for all combined LFAs.</p> <p>Landings of herring in combined NB and NS Gulf were 29,164 t, 25,403 t and 20,418 t in 2010, 2011 and 2012, respectively. Total landings of Canada Atlantic mackerel were 6,468 t and 7,431 t in 2012 and 2013, respectively. Landings of Atlantic mackerel in US were 6,019 t and 5,250 t in 2012 and 2013, respectively.</p> <p>Gaspereau landings in combined NB and NS Gulf were 1,942 t, 1,352 t and 1,343 t in 2010, 2011, and 2012, respectively. Silverside landings in NS Gulf were 188 t, 86 t and 220 t in 2010, 2011, and 2012, respectively.</p> <p>Stock status of bait species is assessed.</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

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>Information is adequate and sufficient to estimate outcome status with respect to biologically based limits, the fishery meeting 80b. Rock crab status is assessed using landings, CPUE from mandatory logbooks and DMP, size frequency distribution, sex ratio, catches rates and biomass estimates from an annual bottom trawl survey. Canadian Atlantic mackerel status is assessed using annual landings, catches description (catch-at-age, length frequencies), Fulton condition factor and age at maturity from field samples and productivity indicator from egg surveys. SGSL herring status is assessed using age-disaggregated gillnet catch rate index for ages 4 to 10 and an acoustic index for age 2 and 3. U.S. mackerel status is assessed using landings, age structure of landings, age structure and biomass from research vessel surveys. Gaspereau and silversides status are assessed using landings. Some gaspereau stocks are assessed in greater details using recruitment data.</p> <p>Information is sufficient to quantitatively estimate outcomes status with a high degree of certainty for fall-spawning herring and U.S. mackerel, but not for the other retained species, preventing the fishery for meeting 100b.</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	
d	Guidepost	<p>Information is adequate to support a strategy to manage retained species, the fishery meeting 80c, but not adequate to evaluate with a high degree of certainty whether the strategy is achieving its objective.</p> <p>There is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery for meeting 100c.</p>			
	Met?		Y	Y	

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>Rock crab status is assessed using landings, CPUE from mandatory logbooks and DMP, size frequency distribution, sex ratio, catches rates and biomass estimates from an annual bottom trawl survey. Canadian Atlantic mackerel status is assessed using annual landings, catches description (catch-at-age, length frequencies), Fulton condition factor and age at maturity from field samples and productivity indicator from egg surveys. SGSL herring status is assessed using age-disaggregated gillnet catch rate index for ages 4 to 10 and an acoustic index for age 2 and 3. U.S. mackerel status is assessed using landings, age structure of landings, age structure and biomass from research vessel surveys. Gaspereau and silversides status are assessed using landings. Some gaspereau stocks are assessed in greater details using recruitment data.</p> <p>The fishery keeps records of bait use by the lobster harvesters to determine potential changes in the fishery's impacts on species used as bait. DFO conducted telephone surveys in 2005 and 2011 to gain additional information on the nature and amount of bait used in the NB and NS lobster fishery. Moreover, during at-sea sampling activities and the recruitment-index program which began in 1982 and 1999, respectively and are carried out annually, DFARD staff records the type and amount of bait used.</p> <p>Therefore, the Assessment team considered that sufficient data continue to be collected to detect any increase in risk level, and monitoring of retained species is conducted in sufficient details to assess ongoing mortalities to all retained species, the fishery meeting 80d and 100d.</p>
References		<p>DFO 2013c. Assessment of the rock crab (<i>Cancer irroratus</i>) fishery in the southern Gulf of St. Lawrence for 2006 to 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/030.</p> <p>DFO 2001. Gaspereau Maritime Provinces overview. DFO Science Stock Status Report D3-17 (2001).</p> <p>DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.</p> <p>DFO 2012f. Assessment of Atlantic herring in the southern Gulf of St. Lawrence (NAFO Div. 4T). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/014.</p> <p>DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.</p> <p>DFO Fisheries Statistics: http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritime-eng.htm</p> <p>Silversides: http://www.glf.dfo-mpo.gc.ca/Gulf/FAM/IMFP/2000-2004-Silversides-PEI</p> <p>U.S. Atlantic mackerel: http://www.nefsc.noaa.gov/sos/spsyn/pp/mackerel/</p>
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		NA

UoCs 2, 3 and 4

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	Y
		<p>All inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab, rock crab, and sculpin. In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab that is 130 mm and greater in length. However, in actual fishing practices, sculpin is not retained.</p> <p>Accurate and verifiable information on the catch of all retained species is available and the consequences for the status of affected populations, the fishery meeting 100a. Data catch of crab species caught during the lobster fishery were compiled. A study examining lobster fishery bait-to-catch ratios in Nova Scotia showed that the estimated amount of bait required to catch each lobster ranged from 185 g (November) to 1455 g (April) for average months during the 2002/03, 2003/04 and 2004/05 fishing seasons. The estimated amount of mackerel, rock crab and herring used as bait in 2012 was 8,153 t, 5,512 t and 7,601 t respectively, for all combined LFAs. Atlantic mackerel uses as bait is purchased by lobster fishermen to directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in mackerel stock assessment. Landings of herring in combined NB and NS Maritimes were 70,909 t, 63,317 t and 51,661 t in 2010, 2011 and 2012, respectively. Total landings of Canada Atlantic mackerel were 6,468 t and 7,431 t in 2012 and 2013, respectively. Landings of Atlantic mackerel in US were 6,019 t and 5,250 t in 2012 and 2013, respectively.</p> <p>Stock status of bait species is assessed.</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

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>Information is adequate and sufficient to estimate outcome status with respect to biologically based limits, the fishery meeting 80b. According to DFO, there have been no recent stock assessments for inshore rock crab, nor are assessments being planned for the species during the upcoming year. Inshore crabs were identified as secondary fishery stocks during a recent DFO review of primary/secondary fishery stocks. As a result, resources are not presently allocated to stock assessments for inshore rock crab. DFO's plan for secondary stocks is that the basis for management advice is provided through existing science surveys, industry survey results, fishery-dependent information, or habitat information (e.g. benthic classification). DFO reviews the rock crab landings, as priority dictates and/or opportunity allows, to determine what information about these species can be learned. Canadian Atlantic mackerel status is assessed using annual landings, catches description (catch-at-age, length frequencies), Fulton condition factor and age at maturity from field samples and productivity indicator from egg surveys. Herring in 4VWX is assessed using landings, catch at age (acoustic survey), biomass estimates (acoustic survey and collaborative survey with industry). U.S. mackerel status is assessed using landings, age structure of landings, age structure and biomass from research vessel surveys.</p> <p>Information is sufficient to quantitatively estimate outcomes status with a high degree of certainty for herring and U.S. mackerel, but not for the rock crab and Canadian mackerel, preventing the fishery for meeting 100b.</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
	Justification	<p>Information is adequate to support a strategy to manage retained species, the fishery meeting 80c, but not adequate to evaluate with a high degree of certainty whether the strategy is achieving its objective.</p> <p>There is no formal partial strategy in place in the lobster fishery to ensure that the fishery does not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery for meeting 100c.</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.
	Met?		Y	N

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>Sufficient data continue to be collected to detect any increase in risk level. But monitoring of all retained species is not conducted in sufficient details to assess ongoing mortalities to all retained species, preventing the fishery from meeting 100d.</p> <p>Canadian Atlantic mackerel status is assessed using annual landings, catches description (catch-at-age, length frequencies), Fulton condition factor and age at maturity from field samples and productivity indicator from egg surveys. Herring in 4VWX is assessed using landings, catch at age (acoustic survey), biomass estimates (acoustic survey and collaborative survey with industry). U.S. mackerel status is assessed using landings, age structure of landings, age structure and biomass from research vessel surveys.</p> <p>There is no stock assessment for crab species, preventing the fisheries from meeting 100d.</p>
	References	<p>DFO 2012e. Assessment of the Atlantic mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2011. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/031.</p> <p>DFO 2013f. 2013 Assessment of 4VWX herring. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/045.</p> <p>DFO 2014b. Assessment of the Atlantic Mackerel stock for the Northwest Atlantic (Subareas 3 and 4) in 2013. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/030.</p> <p>Robichaud, D.A., and Frail, C. 2006. Development of Jonah crab, <i>Cancer borealis</i>, and rock crab, <i>Cancer irroratus</i>, fisheries in the Bay of Fundy (LFAs 35-38) and off southwest Nova Scotia (LFA 34): from exploratory to commercial status (1995-2004). Can. Manuscr. Rep. Fish. Aquat. Sci. 2775: iii + 48 pp.</p> <p>DFO Fisheries Statistics: http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritime-eng.htm</p> <p>U.S. Atlantic mackerel: http://www.nefsc.noaa.gov/sos/spsyn/pp/mackerel/</p>
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.2.1

UoC 1

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)	(Y/N)	(Y/N)
	Justification	RBF used for scoring, see Table 1.2.1c in Appendix 1.2		
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/N)	(Y/N)	
	Justification	RBF used for scoring, see Table 1.2.1c in Appendix 1.2		
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/N)		
	Justification	RBF used for scoring, see Table 1.2.1c in Appendix 1.2		
References		Comeau, P.A., M.J. Tremblay, S. Campana, G. Young, C. Frail and S. Rowe. Review of the St. Mary's Bay Longhorn Sculpin Fishery. 2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/051. vi + 75 p. Information provided by DFO and lobster fishermen during site visit meetings.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				NA

UoCs 2, 3, 4

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 for cusk N for cod	N	N

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	<p>Based on the available documentation and information, the Assessment team considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is low. However, cod and cusk are considered as main bycatch species.</p> <p>The catch of 41 lobster fishing trips were sampled at-sea between November 2005 and July 2006 in Eastern Scotian Shelf. As a result, more than 90% of the catch, by weight and number, was lobster. None of the bycatch species represented 5% or more than 5% of the lobster catches.</p> <p>The Guysborough County Inshore Fishermen's Association has been recording incidental catch (in number) for LFAs 31a and 31b since 2009. The data is collected throughout the fishing season (May and June for LFA 31a and April and May for LFA 31b) during at sea samples. The study showed that the mean percentage of all non-lobster species caught in lobster traps was 11% and 4.3% for LFA 31a and LFA 31b, respectively; and the mean percentage of non-lobster species minus rock crab, green crab and sculpin (that are allowed to be landed by licence conditions) was 9% and 1.3%.</p> <p>The Maritimes Region lobster fisheries were at-sea sampled as part of the <i>SARA</i> bycatch study, for levels of incidental catches during 2009-2010 lobster fishing season. The conclusion was that the overall incidental catch, with exception of the crab species, was low.</p> <p>Although no <i>SARA</i> sampling was completing for LFAs 35-38 (UoC 4), qualitative and some quantitative information on bycath is available from at-sea samples. If legally retained crab species are not included, bycatches are estimated to be approximately 1% of the total catch, and include sculpin, cod, cusk, hermit crab, flounder, and whelk.</p> <p>Although cod and cusk catches were estimated to be below 5% of Maritimes lobster fisheries total catch, both species were considered as main bycatch species due to their vulnerability (MSC GCB3.5.2). The most recent 4X5Yb cod stock assessment showed that the SSB of 10,600 t was below the limit reference point of 24,000 t, therefore cod is outside biologically based limits. Cusk is considered as threatened under the COSEWIC and is not listed under the <i>SARA</i>. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the limit reference point for the last 3 years, therefore cusk is likely to be within limits but it cannot be considered that cusk is highly likely to be within limits.</p> <p>Between 2011-2014, two Atlantic minke whales, which are not are not considered as ETP species, were entangled in lobster trap, one died and the fate of the other was unknown. The best estimate of abundance for minke whales is 20,741 animals, and the minimum population estimate for the Canadian East Coast minke whale is 16,199 animals. The minke whale is common and widely distributed within the Canada and the U.S. Atlantic EEZ. The Canadian East Coast population is not listed under the <i>SARA</i> and is considered not at risk under the COSEWIC. Although the assessment team considered the population to be highly likely within biological based limits, it cannot be considered that there is a high certainty that minke whale is within biological based limits as no trend analysis has been conducted and current and maximum net productivity rates are unknown.</p>

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		
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	
c	Justification	<p>There is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding of the main bycatch species.</p> <p>Cod and cusk are considered as the main bycatch species.</p> <p>The most recent 4X5Yb cod stock assessment showed that the SSB of 10,600 t was below the limit reference point of 24,000 t, therefore cod is outside biologically based limits. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the limit reference point for the last 3 years, therefore cusk is within limits.</p> <p>Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cod: lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps has been reduced over the years. There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and evidence from tagging studies that indicate cod survive after being captured and released from lobster traps.</p>		
	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.		
c	Met?	Y		
	Justification	<p>The status of main bycatch species is known.</p> <p>The most recent 4X5Yb cod stock assessment showed that the SSB of 10,600 t was below the limit reference point of 24,000 t, therefore cod is outside biologically based limits. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the limit reference point for the last 3 years, therefore cusk is within limits.</p> <p>Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cod and cusk.</p>		
References		Delorey, S. 2013. Overview of Incidental Bycatch and Live Discards for areas LFAs 31A and 31B. Based on the Guysborough County Inshore Fishermen's Association At-Sea sampling data from 2009-2013.		

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
	<p>den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. Can. Tech. Rep. Fish. Aquat. Sci. 2890: vii + 39 p.</p> <p>DFO 2005. Proceedings of the Maritimes Provinces Regional Advisory Process on Scotia-Fundy Groundfish Stocks; 31 October – 3 November 2005. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2005/032.</p> <p>DFO 2014d. Update to the Recovery Potential for Cusk in Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/048.</p> <p>DFO 2014e. Stock Status Update of Cusk (<i>Brosme brosme</i>) in NAFO Divisions 4VWX5Z Under The Precautionary Approach Framework. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/019.</p> <p>DFO 2014f. Proceedings of a Maritimes Science Peer review of the Lobster Fishing Areas (LFAs) 34-35 Lobster (<i>Homarus americanus</i>) Assessment; February 12-14, 2013. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2014/041.</p> <p>DFO 2015. 2014 4X5Yb Atlantic Cod Stock Status Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/nnn.</p> <p>Harris, L.E. and A.R. Hanke 2010. Assessment of the Status, Trends and Recovery potential of Cusk (<i>Brosme brosme</i>). DFO Can. Sci. Advis. Sec. Res. Doc. 2010/004. vi + 23 p.</p> <p>Pezzack, D.S., Denton, C.M., and Tremblay, M.J. 2014. Overview of Bycatch and Discards in the Maritimes Region Lobster Fishing Areas (LFAs) 27-33 based on <i>Species at Risk</i> (SARA) At-sea sampling 2009-2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/040. V + 27 p.</p> <p>Taggart, C.T., P. Penney, N. Barrowman and C. George 1995. The 1954-1993 Newfoundland cod-tagging database: statistical summaries and spatial-temporal distributions. Can. Tech. Rep. Fis. and Aquat. Sci. 2042.</p> <p>Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.</p> <p>Information provided by DFO and lobster harvesters during the site visit.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.2.2

UoC 1

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		<p>Under licence conditions, sculpin is allowed to be landed. However, in actual fishing practices, sculpin is returned immediately to the sea in a manner that causes the least harm, as they have no commercial value neither are used as bait. Sculpin has been identified as main bycatch species by stakeholders during the RBF meeting.</p> <p>Sea urchins, whelk and minke whale have been identified as minor bycatch species.</p> <p>There is a partial strategy in place to ensure that the NB and NS lobster fishery does not pose a risk or irreversible harm to bycatch species populations: the seasonality of the fishery, the limited number of licences and traps, the requirement of escape vent and modified biodegradable panels will be required for the 2013 fishing season for all LFAs in the SGSL, reducing non-target species catch and impacts from lost traps ("ghost fishing"), and the requirement of a minimum of 6 traps per line in LFA 26A and fishing practices in LFA 25 (traps set per line even not required) reducing the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals. Moreover, the Assessment team considered that the strategy of fishing effort reduction adopted by DFO from 1998 to 2006 and after 2009 through licence retirement (reducing the number of harvesters), reduction of the number of traps per licence and fishing only six days per week would have reduced bycatches. Individuals are immediately and carefully returned to the water, and survival is thought to be high for fish and shellfish species.</p> <p>However, a N has been attributed to 100a as there is not a full strategy in place for managing and minimizing bycatch. Sculpin is not a commercial species, so there is no management plan or harvesting and conservation plan in place for those species. Furthermore, the status of sculpin is not assessed. There is not a comprehensive strategy in place for managing and minimizing minke whale bycatch.</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	N

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		
	Justification	There is some evidence that the partial strategy is being implemented successfully. No decrease sculpin abundance has been observed over the years, and minke whale bycatch estimates in the SGSL is by far lower than the PBR of 162. However, there is no strategy in place for managing and minimizing bycatch species, preventing the fishery from meeting 100b.		
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
	Justification	There is some evidence that the partial strategy is being implemented successfully. The lobster fishery harvest strategy is implemented successfully, and compliance with escape vents and traps set per line requirements is high. Furthermore, no decrease in sculpin abundance has been observed over the years, and minke whale bycatch estimates in the SGSL is by far lower than the PBR of 162. However, there is no strategy in place for managing and minimizing bycatch species, preventing the fishery from meeting 100c.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	There is no strategy in place for managing and minimizing bycatch species, preventing the fishery from meeting 100d.		
References		<p>DFO 2012c. Notice to Fish Harvesters – Requirements for modified biodegradable panels on lobster traps for all Lobster Fishing Areas in the Southern Gulf of St. Lawrence. DFO Gulf Region, June 22, 2012. EKME 2608173.</p> <p>DFO 2013b. American lobster, <i>Homarus americanus</i>, stock status in the Southern Gulf of St. Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.</p> <p>Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.</p> <p>Information provided by DFO, and lobster fishermen.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

UoCs 2, 3, and 4

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	<p>There is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding of the main bycatch species.</p> <p>Main bycatch species are cod and cusk.</p> <p>Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cod: lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps has been reduced over the years. There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and evidence from tagging studies that indicate cod survive after being captured and released from lobster traps.</p> <p>Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of cusk: cusk were legally landed from the lobster fisheries until 1999, then from this date cusk were not allowed to be retained. Also, lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps was reduced over the years. There is evidence that this partial strategy works based on the fact that cusk bycatch estimates are well below the 5% threshold, much lower than catches observed in groundfish longline fisheries in 4X5Z, and it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years.</p> <p>There is a partial strategy in place to ensure that the NB and NS lobster fishery does not pose a risk or irreversible harm to minke whale: the seasonality of lobster fisheries, the limited numbers of licences and traps, traps has been reduced over the years, and voluntary industry projects in LFA 33, 34 and the Bay of Fundy have been implemented to minimize mortality of marine mammals. However, a N has been attributed to 100a as there is not a full strategy in place for managing and minimizing all bycatches, including minke whale. Some bycatch species are non-commercial species, so there is no management plan or harvesting and conservation plan in place for those species. Furthermore, the status of these species is not assessed.</p>		

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		
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	<p>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.</p> <p>There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and evidence from tagging studies that indicate cod survive after being captured and released from lobster traps. Also, cusk bycatch estimates are well below the 5% threshold, much lower than catches observed in groundfish longline fisheries in 4X and 5Z. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the LRP for the last 3 years and it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years.</p> <p>However, there is no strategy in place for managing and minimizing all bycatch species, preventing the fishery from meeting 100b.</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	
Justification	<p>There is some evidence that the partial strategy is being implemented successfully.</p> <p>The lobster fisheries harvest strategy is implemented successfully, and compliance with gear requirements is high.</p> <p>There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and evidence from tagging studies that indicate cod survive after being captured and released from lobster traps. Also, cusk bycatch estimates are well below the 5% threshold, much lower than catches observed in groundfish longline fisheries in 4X and 5Z. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the LRP for the last 3 years and it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years.</p> <p>However, there is no strategy in place for managing and minimizing bycatch species, preventing the fisheries from meeting 100c.</p>			
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
Met?			N	

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
	Justification	There is no strategy in place for managing and minimizing all bycatch species, preventing the fisheries from meeting 100d.
		<p>Delorey, S. 2013. Overview of Incidental Bycatch and Live Discards for areas LFAs 31A and 31B. Based on the Guysborough County Inshore Fishermen's Association At-Sea sampling data from 2009-2013.</p> <p>den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. Can. Tech. Rep. Fish. Aquat. Sci. 2890: vii + 39 p.</p> <p>DFO 2005. Proceedings of the Maritimes Provinces Regional Advisory Process on Scotia-Fundy Groundfish Stocks; 31 October – 3 November 2005. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2005/032.</p> <p>DFO 2014d. Update to the Recovery Potential for Cusk in Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/048.</p> <p>DFO 2014e. Stock Status Update of Cusk (<i>Brosme brosme</i>) in NAFO Divisions 4VWX5Z Under The Precautionary Approach Framework. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/019.</p> <p>DFO 2015. 2014 4X5Yb Atlantic Cod Stock Status Update. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/nnn.</p> <p>Harris, L.E. and A.R. Hanke 2010. Assessment of the Status, Trends and Recovery potential of Cusk (<i>Brosme brosme</i>). DFO Can. Sci. Advis. Sec. Res. Doc. 2010/004. vi + 23 p.</p> <p>Pezzack, D.S., Denton, C.M., and Tremblay, M.J. 2014. Overview of Bycatch and Discards in the Maritimes Region Lobster Fishing Areas (LFAs) 27-33 based on <i>Species at Risk</i> (SARA) At-sea sampling 2009-2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/040. V + 27 p.</p> <p>Taggart, C.T., P. Penney, N. Barrowman and C. George 1995. The 1954-1993 Newfoundland cod-tagging database: statistical summaries and spatial-temporal distributions. Can. Tech. Rep. Fis. and Aquat. Sci. 2042.</p> <p>Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.</p> <p>Information provided by DFO, and lobster fishermen.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.2.3

UoC 1

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	Guidedpost	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	Sculpin have been identified as the main bycatch species by stakeholders during the RBF meeting. An estimation of the amount of sculpin caught in lobster traps is 3-4 individuals per day for the entire number of traps of one fisherman. Thus qualitative and some quantitative information are available on the amount of main bycatch species in the fishery, but accurate and verifiable information is not on the amount of all bycatch species and the consequences for the status of affected population, preventing the fishery from meeting 100a.		
b	Guidedpost	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?	Not relevant	Not relevant	Not relevant
	Justification	Scoring issue need not be scored when RBF used to score PI 2.1.1		
c	Guidedpost	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 retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	N	N
	Justification	Qualitative and some quantitative information are adequate to support measures to manage bycatch species, but are inadequate to support a partial strategy due to the absence of bycatch data collection in the fishery. Therefore the fishery meets 60c.		

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		
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?		N	N
	Justification	Due to the absence of bycatch data collection in the fishery, sufficient data are not collected to detect any increase in risk and to assess mortalities to bycatch species, preventing the fishery from meeting 80d and 100d.		
References		Information provided by DFO and lobster fishermen during site visit meeting.		
OVERALL PERFORMANCE INDICATOR SCORE:				70
CONDITION NUMBER (if relevant):				4

UoCs 2, 3 and 4

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

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				
		<p>Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the lobster fisheries.</p> <p>Based on the available documentation and information, the Assessment team considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is low.</p> <p>As part of their Science Activities which include research and monitoring of lobster in the LFA 27, LFA 27 Management Board conducts at sea-sampling to record incidental catch since 2011 . 27, 38, 45 and 75 at-sea samples were taken during the lobster fishing season in 2011, 2012, 2013 and 2014, respectively.</p> <p>The Guysborough County Inshore Fishermen's Association has been recording incidental catch (in number) for LFAs 31a and 31b since 2009. The study showed that the mean percentage of all non-lobster species caught in lobster traps was 11%, and 4.3% for LFA 31a and LFA 31b, respectively; and the mean percentage of non-lobster species minus rock crab, green crab and sculpin (that are allowed to be landed by licence conditions) was 9% and 1.3%.</p> <p>The catch of 41 lobster fishing trips were sampled at-sea between November 2005 and July 2006 in Eastern Scotian Shelf. As a result, more than 90% of the catch, by weight and number, was lobster. None of the bycatch species represented 5% or more than 5% of the lobster catches.</p> <p>The Maritimes Region lobster fisheries were at-sea sampled as part of the Species at Risk (SARA) bycatch study, for levels of incidental catches during 2009-2010 lobster fishing season. The results showed that the non-lobster portion of the total catch ranges from 1.5% in LFA 31B to 13% in LFA 33. If legally retained crab species are not included, bycatches range from 0.1% (LAF 32) to 7.5% (LFA 33). The conclusion of this study was that the overall incidental catch, with exception of the crab species, was low.</p> <p>A special sampling project was undertaken to estimate cusk bycatch in LFA 34 lobster fishery.</p> <p>Although no SARA sampling was completing for LFAs 35-38 (UoC 4), qualitative and some quantitative information on bycatch is available from at-sea samples. If legally retained crab species are not included, bycatches are estimated to be approximately 1% of the total catch, and include sculpin, cod, cusk, hermit crab, flounder, and whelk.</p> <p>However, there is no accurate and verifiable information on the catch of all bycatch species and the consequences for the status of affected population for most of LFAs, preventing fisheries from meeting 100a.</p>				
Justification		b	Guidepost	Met?		
			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
			Information is sufficient to estimate outcome status with biologically based limits but not sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.			

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			
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	
Justification		A partial strategy is in place to ensure that the lobster fisheries do not hinder the recovery of cod and cusk, and information is adequate to support the partial strategy to manage these species. However, information is not adequate to support a strategy to manage all bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. Therefore, 100c is not met.			
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?		N	N	
	Justification	Due to the absence of bycatch data collection on an on-going basis in all LFAs, sufficient data are not collected to detect any increase in risk and to assess mortalities to potential main bycatch species, preventing the fishery from meeting 80d and 100d.			
References		<p>Brzeski V. 2014. A report on the Science and Governance activities of LFA 27, 2011-2014. LFA 27 Management Board.</p> <p>Delorey, S. 2013. Overview of Incidental Bycatch and Live Discards for areas LFAs 31A and 31B. Based on the Guysborough County Inshore Fishermen's Association At-Sea sampling data from 2009-2013.</p> <p>den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. Can. Tech. Rep. Fish. Aquat. Sci. 2890: vii + 39 p.</p> <p>DFO 2014f. Proceedings of a Maritimes Science Peer review of the Lobster Fishing Areas (LFAs) 34-35 Lobster (<i>Homarus americanus</i>) Assessment; February 12-14, 2013. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2014/041.</p> <p>Harris, L.E. and A.R. Hanke 2010. Assessment of the Status, Trends and Recovery potential of Cusk (<i>Brosme brosme</i>). DFO Can. Sci. Advis. Sec. Res. Doc. 2010/004. vi + 23 p.</p> <p>Pezzack, D.S., Denton, C.M., and Tremblay, M.J. 2014. Overview of Bycatch and Discards in the Maritimes Region Lobster Fishing Areas (LFAs) 27-33 based on <i>Species at Risk</i> (SARA) At-sea sampling 2009-2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/040. V + 27 p.</p> <p>Information provided by DFO and lobster fishermen.</p>			

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
OVERALL PERFORMANCE INDICATOR SCORE:	75
CONDITION NUMBER (if relevant):	4

Evaluation Table for PI 2.3.1

For all 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

PI 2.3.1	<p>The fishery meets national and international requirements for the protection of ETP species</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species</p>
Justification	<p>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.</p> <p>Northern wolfish, spotted wolfish, Atlantic wolfish, the leatherback turtle, north Atlantic right whale, blue whale, fin whale and humpback whale are listed under <i>SARA</i>.</p> <p>From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf. From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes. The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes. There were no reported catches of leatherback turtle.</p> <p>In 2011, one unidentified whale species was reported entangled in lobster traps in the SGSL and was successfully released alive.</p> <p>In the Maritimes, one humpback whale was reported entangled in lobster trap and successfully released alive between 2011 and 2014.</p> <p>While there is a potential for interaction between lobster gear and whales, the seasonality of the lobster fisheries and the times and areas of known whale concentrations result in low potential for interactions. Although the assessment team acknowledges the lobster fishing season in the Grey Zone, LFA 38B, lasts from June to November and therefore overlaps with months right whale are present in the Bay of Fundy, both Canadian and U.S. lobster harvesters fish in this Zone, U.S. harvesters fishing year-round. All the LFA 38 lobster licence holders (136 licences) are eligible to fish in the Grey Zone, but the average number of Canadian fishing boats operating in the Grey Zone has been closer to 20-25 each summer (DFO Maritimes, <i>pers. comm.</i>, April 2015). Moreover, Johnson et al (2007) show that the groundfish gillnet and groundfish hook and line fisheries likely pose the greatest risk for right whale entanglements. These fisheries made up the bulk of fishing effort in Scotia-Fundy between the months of June and October when the highest densities of right whales occur, and sets were widely distributed throughout the region. There was also no indication of potential overlap of right whale and lobster trap gear in the vicinity of either whale Conservation Zone.</p> <p>Regarding the Gulf of St Lawrence, there is low or no overlap between the presence of right whale and the SGSL lobster trap fishery. The highest concentration of right whale occurs in Gaspé Peninsula which is not part of the UoCs currently under assessment. Moreover, there is no lobster fishing activities in the SGGSL during the summer and the fall, except in LFA 25 where the lobster fishing season lasts from mid-August to mid-October.</p> <p>Based on the evidence provided, the assessment team evaluated that it is highly likely that the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries do not pose a risk of serious or irreversible harm to ETP species and do not hinder recovery of ETP species.</p> <p>However, the absence of observer coverage in lobster fisheries may produce inadequate data coverage to fully satisfy 100a. It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on ETP species found in the fisheries areas. Therefore, it cannot be said that there is a high degree of certainty that lobster fisheries are within limits of national and international requirements for protection of ETP Species, preventing the fisheries from meeting 100a.</p>

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		
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
	Justification	<p>Direct effects are highly unlikely to create unacceptable impacts to ETP species.</p> <p>The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes. There were no reported catches of leatherback turtle. The interaction between the NB and NS lobster fisheries and ETP marine mammals was estimated to be low. The seasonality of the lobster fisheries and the times and areas of known whale concentrations result in low potential for interactions. It was considered that 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.</p> <p>The absence of observer coverage in lobster fisheries may produce inadequate data coverage to fully satisfy 100b. It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on ETP species found in the fisheries areas. Therefore, it cannot be said that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species, preventing the fisheries from meeting 100b.</p>		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y
	Justification	<p>There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.</p> <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 highly likely within limits of national and international requirements for protection of ETP species.</p>		
References		<p>DFO 2007c. Recovery potential assessment for Right whale (Western North Atlantic population). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/027.</p> <p>DFO 2004. Proceedings of Species at Risk Atlantic Zonal Assessment Process – Determination of Allowable Harm for Spotted and Northern Wolffish; May 7, 2004, St. John's, Newfoundland and Labrador. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2004/028.</p> <p>DFO Gulf SARA logbook 2007-2011</p> <p>DFO Maritimes SARA logbook 2010-2012</p> <p>Johnson, T.T., Smedbol, R.K., Serdynska, A., Vanderlaan, A., Helcl, N., Harris, L., and Taggart, C.T. 2007. Patterns of fishing gears in areas of the Bay of Fundy and southwest Scotian Shelf frequented by North Atlantic right whales. Can. Tech. Rep. Fish. Aquat. Sci. 2745: v + 52 p.</p> <p>Marine Mammal Response Program data from 2011-2014</p>		

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
	Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.
OVERALL PERFORMANCE INDICATOR SCORE:	85
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.3.2

For all 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	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. 		
		<p>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.</p> <p>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>A mandatory SARA logbook must be completed and submitted to DFO as a condition of license. Training courses in wolfish release techniques have been provided to license holders. A recovery strategy detailing procedures for expeditious release of wolfish has been established, industry has been trained, reporting procedures of encounters are in place and research on release methods used are monitored to ensure a high level of survival. The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes.</p> <p>The assessment team considers that there is a strategy in place to minimize impact of lobster fisheries on ETP marine mammal and sea turtle species: the reporting of interactions with ETP species is mandatory, recovery strategies and management plans are proposed, the seasonality of all lobster fisheries, the limited numbers of licences and traps, the requirement of a minimum of 6 traps per trap line in LFA 26A and fishing practices in place in LFAs 25 (traps set per lines even if not required) reduces the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals and sea turtles, voluntary industry projects in LFA 33, 34 to reduce excess line in the water column for the protection of right whales have been implemented in 2009 in cooperation with WWF Canada, the Fundy North Fishermen's Association voluntary completed a ghost gear and marine debris removal at the mouth of the Bay of Fundy in summer and fall 2013 to reduce threats to marine mammals due to lost gears, a right whale voluntary mitigation strategy was implemented for the first time in LFAs 36 and 38 in 2007, this strategy is reviewed annually and remains in practice.</p> <p>The interaction between the NB and NS lobster fishery and ETP marine mammal species was estimated to be low. There were no reported catches of leatherback turtle.</p> <p>However, proposed recovery strategies and management plans did not lead to any formal implementation of actions to reduce interactions and mortality to ETP species. Measures in place in the Southwestern Scotian Shelf and the Bay of Fundy to reduce threat to marine mammals are voluntary, so not required. Also, due to the absence of observer coverage, it is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on ETP species found in the fisheries areas. Therefore the Assessment team considers that there is not a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species, preventing the fishery from meeting 100a.</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. The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes. There were no reported catches of leatherback turtle and the interaction between the NB and NS lobster fisheries and ETP marine mammal species was estimated to be low.</p> <p>However, the assessment team is not aware of any quantitative analysis that has been conducted to determine the likely success of the approach used to minimize impact of NB and NS lobster fisheries on the ETP species encountered, preventing the fishery from meeting 100b.</p>		
c	Guidelinepost		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	<p>There is clear evidence that the strategy is being implemented successfully. Once protected under SARA, ETP species are subject to recovery strategies and management plan.</p> <p>A mandatory SARA logbook must be completed and submitted to DFO as a condition of license. Training courses in wolfish release techniques have been provided to license holders. A recovery strategy detailing procedures for expeditious release of wolfish has been established, industry has been trained, reporting procedures of encounters are in place and research on release methods used are monitored to ensure a high level of survival. The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes.</p> <p>The assessment team considers that there is a strategy in place to minimize impact of lobster fisheries on ETP marine mammal and sea turtle species: the reporting of interactions with ETP species is mandatory, recovery strategies and management plans are proposed, the seasonality of all lobster fisheries, the limited numbers of licences and traps, the requirement of a minimum of 6 traps per trap line in LFA 26A and fishing practices in place in LFAs 25 (traps set per lines even if not required) reduces the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals and sea turtles, voluntary industry projects in LFA 33, 34 to reduce excess line in the water column for the protection of right whales have been implemented in 2009 in cooperation with WWF Canada, the Fundy North Fishermen's Association voluntary completed a ghost gear and marine debris removal at the mouth of the Bay of Fundy in summer and fall 2013 to reduce threats to marine mammals due to lost gears, a right whale voluntary mitigation strategy was implemented for the first time in LFAs 36 and 38 in 2007, this strategy is reviewed annually and remains in practice.</p> <p>There were no reported catches of leatherback turtle and the interaction between the NB and NS lobster fisheries and ETP marine mammal species was evaluated to be low.</p> <p>However, due to the absence of observer coverage, it is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on ETP species found in the fisheries areas, preventing the fisheries from meeting 100c.</p>		

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <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. 		
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>From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf. From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes. The amount of spotted and northern wolfishes caught was well below the acceptable limits of harm for northern and spotted wolfishes. There were no reported catches of leatherback turtle and the interaction between the NB and NS lobster fisheries and ETP marine mammal species was estimated to be low.</p>		
References		<p>DFO 2004. Proceedings of Species at Risk Atlantic Zonal Assessment Process – Determination of Allowable Harm for Spotted and Northern Wolffish; May 7, 2004, St. John's, Newfoundland and Labrador. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2004/028.</p> <p>DFO 2007c. Recovery potential assessment for Right whale (Western North Atlantic population). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/027.</p> <p>Atlantic Leatherback Turtle Recovery Team 2006. Recovery Strategy for Leatherback Turtle (<i>Dermochelys coriacea</i>) in Atlantic Canada. <i>Species at Risk Act Recovery Strategy Series</i>. Fisheries and Oceans Canada, Ottawa, vi + 45 pp.</p> <p>Kulka, D., C. Hood and J. Huntington. 2007. Recovery Strategy for Northern Wolfish (<i>Anarhichas dentatus</i>) and Spotted Wolfish (<i>Anarhichas minor</i>), and Management Plan for Atlantic Wolfish (<i>Anarhichas lupus</i>) in Canada. Fisheries and Oceans Canada: Newfoundland and Labrador Region. St. John's, NL. x + 103 pp.</p> <p>Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., Savaria, J.-Y., 2009. Recovery Strategy for the blue whale (<i>Balaenoptera musculus</i>), Northwest Atlantic population, in Canada [FINAL]. <i>Species at Risk Act Recovery Strategy Series</i>. Fisheries and Oceans Canada, Ottawa. 62 pp.</p> <p>Brown, M.W., Fenton, D., Smedbol, K., Merriman, C., Robichaud-Leblanc, K., and Conway, J.D. 2008. Recovery Strategy for the North Atlantic Right Whale (<i>Eubalaena glacialis</i>) in Atlantic Canadian Waters [Proposed]. <i>Species at Risk Act Recovery Strategy Series</i>. Fisheries and Oceans Canada. vi + 63p.</p> <p>DFO Gulf SARA logbook 2007-2011.</p> <p>DFO Maritimes SARA logbook 2010-2012.</p> <p>Marine Mammal Response Program data from 2011-2014</p> <p>Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.</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>http://www.dfo-mpo.gc.ca/species-especes/species-especies/finwhale-atlantic-rorqual-commun-atlantique-eng.htm</p> <p>http://gmfa.nb.ca/wpcontent/uploads/2012/09/Right-Whale-Mitigation-Strategy-2013.pdf</p> <p>Information provided by DFO and lobster fishermen during site visit meeting.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	85
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.3.3

For all 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
		<p>Sufficient data is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p> <p>Under licence condition, lobster harvesters are required to provide information in the SARA Monitoring Document on all interaction with Species at risk while conducting fishing operations.</p> <p>From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf. From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes. There were no reported catches of leatherback turtle. In 2011, one unidentified whale species was reported entangled in lobster traps in the SGSL and was successfully released alive. In the Maritimes, one humpback whale was reported entangled in lobster trap and successfully released alive between 2011 and 2014.</p> <p>The interaction between the NB and NS lobster fisheries and ETP species was thus estimated to be low.</p> <p>However, information is not sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty as there is no observer coverage to verify the information provided by the fishermen in the SARA logbooks, preventing the fishery from meeting 100a.</p>		
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>From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf. From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes. There were no reported catches of leatherback turtle. In 2011, one unidentified whale species was reported entangled in lobster traps in the SGSL and was successfully released alive. In the Maritimes, one humpback whale was reported entangled in lobster trap and successfully released alive between 2011 and 2014.</p> <p>The interaction between the NB and NS lobster fisheries and ETP species was thus estimated to be low.</p> <p>However, the absence of observer coverage in the fishery may produce inadequate data coverage to fully satisfy 100b. It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on the larger ETP species found in the fishery areas.</p>		
c	Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	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.
	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>Under licence condition, lobster harvesters are required to provide information in the SARA Monitoring Document on all interaction with Species at risk while conducting fishing operations.</p> <p>From 2007 to 2012, 4 spotted wolfish, 5 Northern wolfish and 9 Atlantic wolfish were caught by the NB and NS lobster fishery in the Gulf. From 2010 to 2012, 8 spotted wolfish, 21 Northern wolfish and 4 Atlantic wolfish were caught by the NB and NS fisheries in the Maritimes. There were no reported catches of leatherback turtle. In 2011, one unidentified whale species was reported entangled in lobster traps in the SGSL and was successfully released alive. In the Maritimes, one humpback whale was reported entangled in lobster trap and successfully released alive between 2011 and 2014.</p> <p>The interaction between the NB and NS lobster fisheries and ETP species was thus estimated to be low.</p> <p>Although the assessment team considers there is a strategy in place to manage impacts on ETP species, it cannot be said there is a comprehensive strategy in place. Moreover, the absence of observer coverage in the fishery may produce inadequate data coverage. It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on the larger ETP species found in the fishery areas.</p> <p>Therefore, the lobster fisheries does not meet 100c.</p>		
References		<p>DFO Gulf SARA logbook 2007-2011.</p> <p>DFO Maritimes SARA logbook 2010-2012.</p> <p>Marine Mammal Response Program data from 2011-2014</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.
	<p>Waring G .T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.</p> <p>Information provided by DFO and lobster fishermen during site visit meeting.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.4.1

For all UoCs

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. Traps are passive gear types that rely on bait to attract the target species. Although trap fisheries are generally considered to have slight impacts on the habitat, traps can impact biogenic structures (e.g. sponges, corals) through crushing or entanglement. Crushing and scouring effects can result if traps are dragged across the bottom during retrieval or during periods of strong currents.</p> <p>Inshore NB and NS are not considered as a significant area for corals and sponges. Despite a focus on impacts of fishing on habitats as part of Canada's efforts to implement an ecosystem approach to management, there have been no issues or concerns identified to indicate negative habitat impacts of lobster fishing. However, whilst it is evident that no habitat impact issues have been identified justifying a score of 80, there is no specific evidence derived from a habitat specific study in relation to the fishery that support the statement it is highly likely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p>			
	<p>DFO. 2010. Potential impacts of fishing gears (Excluding mobile bottom-contact gears) on marine habitats and communities. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2010/003.</p> <p>Kenchington, E., Lurette, C., Cogswell, A., Archambault, P., Archambault, P., Benoît, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M., and Wareham, V. 2010. Coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/041. Vi + 202 pp.</p> <p>Fuller S., C. Picco, J. Ford, C.-F. Tsao, L. E. Morgan, D. Hangaard, R. Chuenpagdee 2008. How We Fish Matters: Addressing the Ecological Impacts of Canadian Fishing Gear. Ecology Action Centre, Living Oceans Society, and Marine Conservation Biology Institut. ISBN 978-0-9734181-7-0.</p> <p>http://www.dfo-mpo.gc.ca/Library/23654.pdf</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.4.2

For all UoCs

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
		<p>There is a strategy in place for managing the impact of the fishery on habitat types. On June 29, 2013 amendments to the <i>Fisheries Act</i> have been approved. The Fisheries Protection Program and its Policy Statements (November 2013) support changes made to the <i>Fisheries Act</i>. The Fisheries Protection Policy Statement (FPPS) focuses on the management of impacts to fish resulting from habitats degradation or loss and alterations to fish passage and flow.</p> <p>Through the FPPS, DFO objectives are to provide consistent guidance through regulations, standards and directives, and to make regulatory decisions in a timely manner. In this way, proponents will have the necessary information and direction to avoid, mitigate and offset harmful impacts to fish and fish habitat so that they will meet the goal of this policy, and thereby comply with the fisheries protection provisions of the <i>Fisheries Act</i>. The prohibition against <i>serious harm to fish</i> applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the <i>Fisheries Act</i> prohibits <i>serious harm to fish</i> which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”.</p> <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>There are a number of MPAs designated under the <i>Ocean Act</i> (1996), including several areas of interest that are at various stages of progress towards designation. MPAs have been implemented in NB and NS both on Gulf and Maritimes side.</p> <p>Impacts on habitats are limited by restricting the number and size of traps in use, the number of fishermen and the fishing season. It is not authorized to haul the traps more than once per day and fishermen do not voluntary fish on Sundays. Moreover, the strategy of fishing effort reduction adopted by DFO would reduce the impacts on habitats.</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 have been significant efforts to document habitat impacts associated with various fishing gears used in Canadian waters. Trap fisheries in general are considered to have low impact on habitat structure and function. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage.</p> <p>There is no indication that the lobster fishery causes serious or irreversible harm to habitats.</p> <p>However, whilst there is some objective basis for confidence that the partial strategy will work justifying a Y for 80b, there has been no direct testing by way of before-and-after-fishing comparison of the fishing grounds, preventing the fishery from meeting 100b.</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
	Justification	<p>There is clear evidence that the strategy is being implemented successfully.</p> <p>Several Policies have been implemented to support habitat protection and 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>There are have a number of MPAs designated under the <i>Ocean Act</i> (1996), including several areas of interest that are at various stages of progress towards designation. MPAs have been implemented in NB and NS both on Gulf and Maritimes side. In addition, buffer zones were established to prohibit scallop dredging to protect lobster habitat (larval settling areas) in several parts of SGSL.</p> <p>Impacts on habitats are limited by restricting the number and size of traps in use, the number of fishermen and the fishing season. It is not authorized to haul the traps more than once per day and fishermen do not voluntary fish on Sundays. Moreover, the strategy of fishing effort reduction adopted by DFO would reduce the impacts on habitats.</p>		
	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. Despite the focus on impacts of fishing on habitats as part of Canada's effort to implement and ecosystem approach to fisheries management, there have been no issues or concerns identified to indicate negative habitat impacts of lobster fishing.		
References		Fuller S., C. Picco, J. Ford, C.-F. Tsao, L. E. Morgan, D. Hangaard, R. Chuenpagdee 2008. How We Fish Matters: Adressing the Ecological Impacts of Canadian Fishing Gear. Ecology Action Centre, Living Oceans Society, and Marine Conservation Biology Institute. ISBN 978-0-9734181-7-0.		

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
	<p>http://www.dfo-mpo.gc.ca/pnw-ppe/fpp-ppp/index-eng.html</p> <p>http://www.dfo-mpo.gc.ca/Library/23654.pdf</p> <p>http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthic-eng.htm</p> <p>http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/risk-ecolo-risque-back-fiche-eng.html</p> <p>http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm</p> <p>http://www.dfo-mpo.gc.ca/ea-ae/cat1/no1-5/no1-5-intro-eng.htm</p>
OVERALL PERFORMANCE INDICATOR SCORE:	95
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.4.3

For all 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
b	Justification	<p>The nature and the distribution of all main habitat types in the lobster fishery are known at a level of detail relevant to the scale and the intensity of the fishery as coastal and epipelagic habitats of the Gulf of St. Lawrence, Atlantic coast of NS, and Bay of Fundy have been mapped.</p> <p>Eel grass meadows are considered “fish habitats”. Eel grass meadows are observed in protected and shallow estuaries or small bays. Corals and sponges are defined as “fish” and “fish habitat”. According to the FPPS, the prohibition against <i>serious harm to fish</i> applies to fish and fish habitat that are part of or support commercial, recreational or Aboriginal fisheries. Section 35 of the <i>Fisheries Act</i> prohibits <i>serious harm to fish</i> which is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. Inshore NB and NS are not considered as a significant area for corals and sponges</p>		
	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.
c	Met?	Y	Y	N
	Justification	<p>The impacts of traps on habitats have been widely studied, the distribution of the lobster fishery and habitats are well known, and the fishery is temporally restricted. Inshore NB and NS are not considered as a significant area for corals and sponges. Lobster fishing grounds are not considered as a significant area for corals and sponges.</p> <p>However, whilst 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, justifying a Y for 80b, there has been no direct testing by way of before-and-after-fishing comparison of the fishing grounds, preventing the fishery from meeting 100b.</p>		

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	
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
		<p>Sufficient data continue to be collected to detect any increase in risk in habitat. There has been and will continue to be an ongoing focus on habitat changes as part of Canada's commitment to ecosystem based management. The distribution of fishing effort and the lobster population components will continue to be monitored annually as they have been for many years. As part of Canada's commitment to implementation of an ecosystem approach to management, habitat impact of fishing activity will continue to be researched and monitored.</p> <p>However, although there are studies on the nature and the distribution of all main habitat types in the SGSL, the Atlantic coast of NS and the Bay of Fundy, the Assessment team did not find any formal documents describing the changes in the habitat distribution over the time, preventing the fishery from meeting 100c.</p>	
		<p>DFO. 2010. Potential impacts of fishing gears (Excluding mobile bottom-contact gears) on marine habitats and communities. Can. Sci. Adv. Sec. Sci. Adv. Rep. 2010/003.</p> <p>Chuenpagdee, R., Morgan, L.E., Maxwell, S.M., Norse, E.A., and Pauly, D. 2003. Shifting gears: collateral impacts of fishing methods in U.S. waters. Frontiers in Ecology and Environment 1(10): 517-524.</p> <p>Dutil J.-D., S. Proulx, P. S. Galbraith, J. Chassé, N. Lambert and C. Laurian 2012. Coastal and epipelagic habitats of the estuary and Gulf of St. Lawrence. Can. Tech. Rep. Fish. Aquat. Sci. 3009: ix + 87 pp.</p> <p>Fuller S., C. Picco, J. Ford, C.-F. Tsao, L. E. Morgan, D. Hangaard, R. Chuenpagdee 2008. How We Fish Matters: Adressing the Ecological Impacts of Canadian Fishing Gear. Ecology Action Centre, Living Oceans Society, and Marine Conservation Biology Institut. ISBN 978-0-9734181-7-0.</p> <p>Kenchington, E., Lurette, C., Cogswell, A., Archambault, P., Archambault, P., Benoît, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M., and Wareham, V. 2010. Coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/041. Vi + 202 pp.</p> <p>http://www.dfo-mpo.gc.ca/pnw-ppe/fpp-ppp/index-eng.html</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.5.1

For all UoCs

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
		<p>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.</p> <p>Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae). Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Stomach analysis in Northumberland Strait showed that rock crab was the single most important component of the diet (between 45 and 68% of prey biomass). Small sea stars and lobster represented between 0.7 and 12.9% of the prey biomass. Molluscs, polychaetes, and fish remains each did not exceed 7.5% of prey biomass. Predation on planktonic stages of lobster is rare and predation upon benthic stages of lobster is uncommon, principally restricted to finfish (sculpin and cod) and cannibalism (during the moult). DFO investigated lobster and predator-prey relationships using samples collected during trawl surveys in LFA 25 and part of LFA 26. Stomach analysis showed that decapods were the principal prey (57% to 84% of prey biomass), with rock crab being the single most important component of the diet (45% to 78%). Lobster represented 8% to 13% of the prey biomass. It has also been observed that the only demersal fish demonstrated to consume large amounts of lobster was the sculpin. Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequence for lobster population dynamics and the productivity of lobster fisheries. At the contrary, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine (Boudreau and Worm 2010).</p> <p>There is a large amount of literature that describing undesired effects of fishing on marine ecosystems. Fishing impacts include changes in size composition of target species, impacts on benthic communities, loss of diversity, disequilibrium of food web and impacts on habitats.</p> <p>The assessment team could not find any concern indicating that the NB and NS lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, retained, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the negligible impact on bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.</p>		
References		Bianchi, G., Gislason, H., Graham, K., Hill, L., Jin, X., Koranteng, K., Manickchand-Heileman, S., Payá, I., Sainsbury, K., Sanchez, F., and Zwanenburg, K. 2000. Impact of fishing on size composition and diversity of demersal fish communities. ICES Journal of Marine Sciences,		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	<p>57: 558-571.</p> <p>Boudreau S.A. and B. Worm 2010. Top-down control of lobster population in the Gulf of Maine: insights from local ecological knowledge and research surveys. <i>Marine Ecology Progress Series</i> 403: 181-191.</p> <p>Comeau, M., Hanson, J.M., Mallet, M., and Chassé, J. 2008. Framework and assessment for American lobster, <i>Homarus americanus</i>, fisheries in the Southern Gulf of St Lawrence: LFA 23, 24, 25, 26A and 26B. <i>Can. Sci. Advis. Sec. Res. Doc.</i> 2008/054.</p> <p>Goñi R. 1998. Ecosystem effects of marine fisheries: an overview. <i>Ocean & Coastal Management</i> 40: 37-64.</p> <p>Grabowski J.H., J. Gaudette, E.J. Clesceri, P.O. Yund 2009. The role of food limitation in lobster population dynamics in coastal Maine, United States, and New Brunswick, Canada. <i>New Zealand Journal of Marine and Freshwater Research</i> 43: 185-193.</p> <p>Hanson, J.M. 2009. Predator-prey interactions of American lobster (<i>Homarus americanus</i>) in the Southern Gulf of St. Lawrence, Canada. <i>New Zealand Journal of Marine and Freshwater Research</i> 43: 69-88.</p> <p>Pauly D., V. Christensen, J. Dalsgaard, R. Froese, F. Jr. Torres 1998. Fishing Down Marine Food Webs. <i>Science</i> 279: 860-863.</p> <p>http://slgo.ca/en/lobster/context/foodchain.html</p>
OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.5.2

For all 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	Y	

	Justification	<p>There is a full and comprehensive strategy in place to document and address ecosystem impacts associated with fishing activities in Canadian waters.</p> <p>Under the <i>Oceans Act</i> and the <i>Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada</i>, 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.</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>There are a number of MPAs designated under the <i>Ocean Act</i> (1996), including several areas of interest that are at various stages of progress towards designation. MPAs have been implemented in NB and NS in both Gulf and Maritimes side.</p> <p>In addition, buffer zones were established to prohibit scallop dredging to protect lobster habitat (larval settling areas) in several parts of SGSL.</p> <p>The management of NB and NS lobster fishery limits harm to ecosystem structure and function by restricting the number of fishermen, the number and size of traps in use, and the fishing season. A MLS, the release of berried lobster female and a female size restriction are required. Escape vents and biodegradable panels are required on traps, it reduces non-target species catch and impacts from lost traps ("ghost fishing"). Moreover, the Assessment team considered that the strategy of fishing effort reduction adopted by DFO through licence retirement (reducing the number of harvesters), reduction of the number of traps per licence and fishing only six days per week would have reduced impacts on ecosystem components.</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.	<p>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.</p> <p>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.</p>
	Met?	Y	Y	Y

	<p>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. Therefore, the fishery meets 100b.</p> <p>The management of NB and NS lobster fishery limits harm to ecosystem structure and function by restricting the number of fishermen, the number and size of traps in use, and the fishing season. A MLS, the release of berried lobster female and a female size restriction are required. Escape vents and biodegradable panels are required on traps, it reduces non-target species catch and impacts from lost traps ("ghost fishing"). Moreover, the Assessment team considered that the strategy of fishing effort reduction adopted by DFO through licence retirement (reducing the number of harvesters), reduction of the number of traps per licence and fishing only six days per week would have reduced impacts on ecosystem components.</p> <p>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 components. A Five-Years Research Plan (2008-2013) has been developed to support the ecosystem science through its 20 components and their connections.</p> <p>This Research Plan showed how four of the priority areas will be addressed primarily through ERIs. An EOR has been issued bringing together the available knowledge about the Northumberland Strait ecosystem as a basis for identifying both appropriate actions and knowledge gaps for new research. The EOR includes a description of the physical, biological and human systems of the Strait, as well as an ecological assessment and recommendations and research needs</p> <p>In 2000, the GOSLIM project was thus created to develop and implement a management plan for ocean resources in the Gulf. The initial goal of GOSLIM was to describe the Gulf of St. Lawrence ecosystem and to identify activities and issues from a broad Gulf-wide perspective. The ESSIM Initiative was announced by the Minister of Fisheries and Oceans in December 1998 and followed the recommendation from the Sable Gully Conservation Strategy that integrated management approaches be applied to the offshore area around the Sable Gully Area of Interest. The primary aim of the ESSIM Initiative is to develop and implement an Integrated Ocean Management Plan for this large marine region. This multi-year, strategic level plan provides long-term direction and a common basis for integrated, ecosystem-based and adaptive ocean management.</p> <p>Under the <i>Oceans Act</i> and the <i>Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada</i>, 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.</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>There are a number of MPAs designated under the <i>Ocean Act</i> (1996), including several areas of interest that are at various stages of progress towards designation. MPAs have been implemented in NB and NS in both Gulf and Maritimes side. In addition, buffer zones were established to prohibit scallop dredging to protect lobster habitat (larval settling areas) in several parts of SGSL.</p>
anuary 2013	370

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	Y
	Justification	The measures are considered likely to work based on plausible argument and information from the fishery/ecosystem involved. Despite an ongoing focus on ecological research as part of Canada's efforts to implement an ecosystem approach to management, no issues with NB and NS lobster fishing have been identified and there is no indication that the fishery causes any form of ecosystem disruption or harm to ecosystem structure and function. The assessment team could not find any concern indicating that the NB and NS lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, retained, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the negligible impact on bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.		
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	Y

Justification	<p>There is evidence that the measures are being implemented successfully.</p> <p>There are a number of MPAs designated under the <i>Ocean Act</i> (1996), including several areas of interest that are at various stages of progress towards designation. MPAs have been implemented in NB and NS in both Gulf and Maritimes side. In addition, buffer zones were established to prohibit scallop dredging to protect lobster habitat (larval settling areas) in several parts of SGSL.</p> <p>Despite an ongoing focus on ecological research as part of Canada's efforts to implement an ecosystem approach to management, no issues with NB and NS lobster fishing have been identified and there is no indication that the fishery causes any form of ecosystem disruption or harm to ecosystem structure and function.</p> <p>The assessment team could not find any concern indicating that the NB and NS lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the negligible impact on bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.</p>
References	<p>Information provided in the Ecosystem background section of the report.</p> <p>http://www.dfo-mpo.gc.ca/fm-gp/pêches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm</p> <p>http://www.dfo-mpo.gc.ca/ea-ae/cat1/no1-5/no1-5-intro-eng.htm</p> <p>http://www.dfo-mpo.gc.ca/science/publications/fiveyear-plan-quinquennal/index-eng.html</p>
OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.5.3

For all 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 the Gulf of St. Lawrence, the Scotian Shelf and the Bay of Fundy are studied and well known.</p> <p>Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae). Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Stomach analysis in Northumberland Strait showed that rock crab was the single most important component of the diet (between 45 and 68% of prey biomass). Small sea stars and lobster represented between 0.7 and 12.9% of the prey biomass. Molluscs, polychaetes, and fish remains each did not exceed 7.5% of prey biomass. Predation on planktonic stages of lobster is rare and predation upon benthic stages of lobster is uncommon, principally restricted to finfish (sculpin and cod) and cannibalism (during the moult). DFO investigated lobster and predator-prey relationships using samples collected during trawl surveys in LFA 25 and part of LFA 26. Stomach analysis showed that decapods were the principal prey (57% to 84% of prey biomass), with rock crab being the single most important component of the diet (45% to 78%). Lobster represented 8% to 13% of the prey biomass. It has also been observed that the only demersal fish demonstrated to consume large amounts of lobster was the sculpin. Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequence for lobster population dynamics and the productivity of lobster fisheries. At the contrary, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine (Boudreau and Worm 2010).</p>		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
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
c		<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>Main impacts of the fishery on target, retained, bycatch and ETP species, and habitat are identified. There is a comprehensive assessment of the target species. The distribution of fishing effort is known. Crab species landings of lobster fishermen are recorded. Regarding the ETP species catch, a mandatory SARA logbook must be completed and submitted to DFO as a condition of license. Corals and sponges distribution has been investigated showing no overlapping with lobster fishing grounds.</p> <p>However, there is no routine bycatch monitoring in place and there has been no direct impacts on habitats testing by way of before-and-after-fishing comparison of the fishing grounds. Therefore, main interactions between the fishery and ecosystem elements have not been fully investigated, preventing the fishery from meeting 100b.</p>		
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
c		<p>The main function of the target, bycatch, retained and ETP species and habitats are known and understood but monitoring of bycatch data is not conducted to assess ongoing mortalities to all bycatch species and there has been no direct testing by the way of before-after fishing comparison of the fishing grounds, preventing the fishery from meeting 100c.</p>		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
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	
e		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).		
	Guidepost	Sufficient data continue to be collected to detect any increase in risk level. Trawl surveys are on-going and fishery-dependent data, crab species landings, ETP species catch continue to be collected. As part of Canada's commitment to implementation of an ecosystem approach to management, habitat impact of fishing activity will continue to be researched and monitored. However information is insufficient to support the development of strategies to manage ecosystem impacts as monitoring of bycatch data is not conducted to assess ongoing mortalities to all bycatch species, there has been no direct testing by the way of before-after fishing comparison of the fishing grounds, and there is no observer coverage to verify the information provided by the fishermen in the SARA logbooks, preventing the fishery from meeting 100e.	Information is sufficient to support the development of strategies to manage ecosystem impacts.	
	Met?	Y	N	
References		Boudreau S.A. and B. Worm 2010. Top-down control of lobster population in the Gulf of Maine: insights from local ecological knowledge and research		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	<p>surveys. Marine Ecology Progress Series 403: 181-191.</p> <p>Comeau, M., Hanson, J.M., Mallet, M., and Chassé, J. 2008. Framework and assessment for American lobster, <i>Homarus americanus</i>, fisheries in the Southern Gulf of St Lawrence: LFA 23, 24, 25, 26A and 26B. Can. Sci. Advis. Sec. Res. Doc. 2008/054.</p> <p>Grabowski J.H., J. Gaudette, E.J. Clesceri, P.O. Yund 2009. The role of food limitation in lobster population dynamics in coastal Maine, United States, and New Brunswick, Canada. New Zealand Journal of Marine and Freshwater Research 43: 185-193.</p> <p>Hanson, J.M. 2009. Predator-prey interactions of American lobster (<i>Homarus americanus</i>) in the Southern Gulf of St. Lawrence, Canada. New Zealand Journal of Marine and Freshwater Research 43: 69-88.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 3.1.1

For all 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 <u>a framework for 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 <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 <u>binding procedures governing cooperation with other parties</u> which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	N
b	Justification	<p>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.</p> <p>The Canadian fisheries legal system consists of a comprehensive and contemporary system of national statutes and supporting regulations and policy frameworks that are capable of delivering sustainable fisheries and management outcomes in accordance with MSC Principle 1 and 2. The legislation (cited in the main report) empowers the federal minister to manage both fisheries and oceans, implement a precautionary approach, and protect both ETP species and ecosystems within a comprehensive integrated policy framework. The national legal system and supporting instruments are effective and highly structured to foster and achieve effective cooperation with other levels of government, industry stakeholders and NGOs, and the general public. For example, the planning and delivery of fisheries and oceans scientific research activities are particularly well served to deliver management outcomes consistent with MSC Principles 1 and 2 by means of various formal networks, partnerships, and other cooperative arrangements.</p> <p>However, the Assessment Team could not conclude that the nature and scope of the cooperation with other parties was, in every case, subject to binding procedural arrangements. While the DFO Minister has near absolute discretionary powers to establish binding procedures in respect of cooperation with other parties, the Minister can also unbind procedures and/or implement other mechanisms.</p>		
	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	Y

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. 			
Justification	<p>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.</p> <p>The management system includes proactive measures that serve to avoid or minimize fisheries disputes such as through the formal Southern Gulf of St. Lawrence Lobster Advisory Committee and the Maritimes Regional Lobster Advisory Committee processes and other venues held during the year.</p> <p>The management system also provides for the resolution of legal disputes based on the Canadian judicial system at the provincial, territorial and federal levels. The judicial system is acknowledged to be impartial and transparent, and where, at a minimum, the rules of administrative fairness can be applied. Parties may also seek a judicial review of a departmental decision at the federal level in accordance with the provisions of the Canadian Criminal Code.</p> <p>While recourse to the judicial system is available and has been used, this is not the same as the fishery management system itself incorporating an internal legal dispute settlement mechanism that can be used to challenge fishery-specific decisions that are of a legal nature.</p> <p>As a general rule, the policy upon which a disputed decision has been made cannot be appealed. However, in some instances, such as when a commercial fisher is dissatisfied with a departmental licensing policy decision, the fisher can seek to have the decision re-assessed by an independent Appeal Board which may recommend a different course of action to the Minister.</p> <p>The management system is not continually facing court challenges but rather has been influenced by occasional landmark court decisions that have significantly impacted fisheries policies and programs (eg. native treaty rights) and to which it has responded in accordance with the court's determinations.</p> <p>DFO negotiated FSC fishing access agreements with First Nations and other aboriginal organizations which provided allocations for various fisheries subject to agree upon management measures. FSC licences are issued annually and conditions are enforceable under the <i>Aboriginal Communal Fishing Licences Regulations</i>. Where agreements are not in effect or renewed, DFO still issues FSC licences but these may contain fewer conditions than were otherwise agreed to by negotiation.</p> <p>DFO's Aboriginal Fisheries Strategy (1992) provides: (i) the framework for the management of FSC fishing, (ii) Aboriginal groups with an opportunity to participate in the management of fisheries, (iii) contributes to the economic self-sufficiency of Aboriginal communities, (iv) provides a foundation for the development of self-government agreements and treaties, and (v) improves the fisheries management skills and capacity of Aboriginal groups.</p>			
Guidepost	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; vertical-align: top;">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.</td> <td style="padding: 5px; vertical-align: top;">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.</td> <td style="padding: 5px; vertical-align: top;">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.</td> </tr> </table>	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.
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.		

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. 		
	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>In Canada, the nature and scope of the legal rights created explicitly or established by custom of (aboriginal) people dependent on fishing for food, social and ceremonial (FSC) purposes were formally interpreted and defined by the Supreme Court in 1990 (eg. Sparrow Decision). The Court found that the Mi'kmaq of PEI (and others elsewhere) had a treaty right to fish as noted subject to valid conservation objectives, and that access took precedence over other uses of the resource.</p> <p>In response, DFO negotiated FSC fishing access agreements with First Nations and other aboriginal organizations which provided allocations for various fisheries subject to agree upon management measures. FSC licences are issued annually and conditions are enforceable under the <i>Aboriginal Communal Fishing Licences Regulations</i>. Where agreements are not in effect or renewed, DFO still issues FSC licences but these may contain fewer conditions than were otherwise agreed to by negotiation.</p> <p>DFO's Aboriginal Fisheries Strategy (1992) provides: (i) the framework for the management of FSC fishing, (ii) Aboriginal groups with an opportunity to participate in the management of fisheries, (iii) contributes to the economic self-sufficiency of Aboriginal communities, (iv) provides a foundation for the development of self-government agreements and treaties, and (v) improves the fisheries management skills and capacity of Aboriginal groups.</p> <p>While the management system generally respects and observes the legal rights, it does not formally commit to such rights until they have been legally proven or established. The exception to this practice is when fishing rights have been worked out or formalized in the context of treaties and land claims agreements.</p> <p>The Assessment Team concludes that a score of 90 is justified for all 4 Units of certification.</p>		
References		<p>Aboriginal Fisheries Strategy: http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm</p> <p>Aboriginal Communal Fishing Licences Regulations: http://laws-lois.justice.gc.ca/eng/regulations/SOR-93-332/index.html</p>		
OVERALL PERFORMANCE INDICATOR SCORE (all 4 Units of Certification)				90
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 3.1.2

For all 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	N
	Justification	<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>All affected parties and individuals involved in the consultation processes for the NB and NS lobster fisheries are identified. These include representatives of harvesters, processors, Aboriginal communities, government agencies, and NGOs. The processes are open to the general public. The principal formal consultation fora include: the Southern Gulf Lobster Advisory Committee and the Maritimes Regional Lobster Advisory Committee (membership and participants' roles and responsibilities are set out in the Terms of Reference); the Science-based Regional Assessment Process (CSAS-posted participation guidelines, participants' roles and obligations defined); and the industry-focused local lobster advisory committees in all the LFAs that comprise the 4 Units of Certification (Terms of Reference and administrative practices are generally similar across the LFAs; discussion points are focused on local fisheries issues but can be further discussed at regional advisory committee meetings as required; local lobster committee deliberations and those involving members of local fisheries associations are more rules-based with regard to motions and voting).</p> <p>The vast majority of lobster industry representatives who participate in the management process are knowledgeable and experienced fishers who have attended as committee members for many years, and therefore understand well their <u>key</u> roles and responsibilities. This cannot be said for <u>all</u> areas of responsibility and interaction, particularly in regard to the Southern Gulf Lobster Advisory Committee (Unit of Certification 1) where the Assessment Team observed at the last meeting discussion points being added to the agenda at the table, which posed problems for some representatives who did not have the opportunity to consult their peers before speaking to the issues. This limited their level of interaction.</p> <p>It is important to note that the DFO Maritimes Region has in place a Fisheries Sectoral Roundtable which meets twice yearly and which examines a broad range of existing and emerging strategic policies and issues affecting both fisheries and oceans activities. The forum is well represented across the spectrum of activities, is well managed, and serves to promote comprehensive planning and policy development at a strategic level.</p>		

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>		
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 obtained.
	Met?	Y	Y	N
		<p>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.</p> <p>In all 4 Units of Certification, the aforementioned principal consultation fora all regularly seek, accept and consider relevant information from the main affected parties, including local and aboriginal knowledge. SGSL Regional and local advisory committee every 2-3 years and annually, respectively. Maritimes Regional and local advisory committees meet annually. Moreover, according to comments from stakeholders at the April 2014 site visits and an examination of meeting minutes by the Assessment Team, it is evident that the management system demonstrates consideration of the information obtained. This is largely acquired by the direct participation of the parties in the consultation processes but extends to written briefs, reports and emails that are provided during or following consultations. Locally, DFO personnel interact throughout the year with industry stakeholders which further provide the parties opportunities to inform the management system.</p> <p>DFO also consults the parties on other management system issues such as species-at-risk listings and recovery plans, regulatory and policy development and amendments, and changes to service delivery levels. DFO seeks, accepts and considers relevant information that it receives.</p> <p>The Assessment Team is satisfied that DFO provides explanations to the main affected parties regarding how the information it receives is used. Meeting minutes, published reports, and daily interactions support this conclusion. However, the team could not ascertain the extent to which DFO provided explanations to the parties about information it received that was not used.</p>		
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	Y

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
	Justification	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. Information provided to the Assessment Team by DFO, provincial government staff and lobster industry representatives during the April 2014 site visits confirmed that all interested and affected parties are provided the opportunity and encouragement to contribute to the discussions regarding the management system for the fishery. The administrative rules relating to the process facilitates effective engagement by the parties. Moreover, a member of the Assessment Team observed the proceedings of the December 2013 meeting of the Southern Gulf of St. Lawrence Lobster Advisory Committee, thus acquiring first-hand knowledge of the scope of the interactions of the participants. The Assessment Team concludes that a score of 90 is warranted for all 4 Units of Certification.
References		Departmental and Industry information and commentary provided to the Assessment Team during the April 2014 site visits. Examination of the Terms of Reference and reporting minutes of the regional and various local advisory committee meetings.
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.1.3

UoC 1

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 Principles 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	Partial

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 management policy. DFO nationally has developed a suite of explicit statements (vision, mission) and management policy frameworks with operational guidelines that define clear long-term objectives and how they can be implemented in a manner that is consistent with MSC Principles and Criteria and the precautionary approach. Policy frameworks have been developed for DFO's Fisheries Management, Science, Ecosystem, and Oceans sectors and all are posted on the department's national website. Science-based frameworks have been peer-reviewed where required. In several instances, guidance and planning and monitoring tools have been developed to ensure associated decision-making within management policy meets the long-term objectives.</p> <p>DFO's Sustainability Fisheries Framework and supporting policy guidance best reflects the requirements of MSC Principles and Criteria. It lays the foundation for an ecosystem-based and precautionary approach to fisheries management in Canada. In 2010, DFO Science initiated work on identifying those indicators that would best serve as reference points for the eventual design and implementation of the precautionary approach for the various lobster stocks of Atlantic Canada and Quebec.</p> <p>Subsequently, Gulf lobster biologists developed a precautionary approach model for lobster fisheries. For Unit 1, the peer-reviewed model was discussed with the Assessment Team in January 2014 and a CSAS publication is in the final stages. The team notes that well defined harvest control rules, associated with the recently approved reference points, that conform to the precautionary approach for the lobster fisheries have yet to be determined and incorporated within the IFMP.</p> <p>Therefore, the precautionary approach is explicit but not required in the lobster fishery management policy, the assessment team thus considers that 100a is partially met and assigned a score of 90.</p>		
References <p>Science</p> <ol style="list-style-type: none"> 1. A Framework for the Application of Precaution in Science-based Decision-Making about Risk http://www.pco.bcp.gc.ca/index.asp?lang=eng&page=information&sub=publications&doc=precaution/precaution_e.htm 2. DFO's Oceans Management Approach http://www.dfo-mpo.gc.ca/oceans/management-gestion/index-eng.htm 3. A New Ecosystem Science Framework in Support of Integrated Management http://www.dfo-mpo.gc.ca/science/Publications/Ecosystem/index-eng.htm <p>Ecosystem Management</p> <ol style="list-style-type: none"> 1. Ecosystem Considerations in Fisheries Management http://www.dfo-mpo.gc.ca/fgc-cgp/documents/parsons_e.pdf 2. Guidelines on Evaluating Ecosystem Overviews and Assessments http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_026_e.pdf 3. Policy for Managing the Impact of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/pesches-fisheries/fish-ren-peche/sff-cpd/benthic-back-fiche-eng.htm <p>Oceans</p>		

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
	<p>1. Canada's Ocean Strategy – Policy and Operational Framework http://www.dfo-mpo.gc.ca/oceans/publications/cosframework-cadresoc/pdf/im-gi-eng.pdf</p> <p>Fisheries Management</p> <p>1. Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>2. A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm</p> <p>3. Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-policy-prise-access-eng.htm</p> <p>4. Application of the Sustainable Fisheries Framework through the Integrated Fisheries Management Planning Process http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/ifmp-pgip-back-fiche-eng.htm</p>
OVERALL PERFORMANCE INDICATOR SCORE:	90
CONDITION NUMBER (if relevant):	NA

UoCs 2, 3, and 4

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	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 Principles 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	Partial

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 management policy. DFO nationally has developed a suite of explicit statements (vision, mission) and management policy frameworks with operational guidelines that define clear long-term objectives and how they can be implemented in a manner that is consistent with MSC Principles and Criteria and the precautionary approach. Policy frameworks have been developed for DFO's Fisheries Management, Science, Ecosystem, and Oceans sectors and all are posted on the department's national website. Science-based frameworks have been peer-reviewed where required. In several instances, guidance and planning and monitoring tools have been developed to ensure associated decision-making within management policy meets the long-term objectives.</p> <p>DFO's Sustainability Fisheries Framework and supporting policy guidance best reflects the requirements of MSC Principles and Criteria. It lays the foundation for an ecosystem-based and precautionary approach to fisheries management in Canada. In 2010, DFO Science initiated work on identifying those indicators that would best serve as reference points for the eventual design and implementation of the precautionary approach for the various lobster stocks of Atlantic Canada and Quebec.</p> <p>Subsequently, Maritimes lobster biologists developed a precautionary approach model for lobster fisheries. For Units 2, 3 and 4, the median of the lobster landings from 1985-2009 was used as a B_{msy} proxy with the USR and LRP values set at 80% and 40% respectively in accordance with DFO's guidance document on the application of the PA. The IFMP for the lobster fisheries of these Units was approved in 2011. It outlines an approach that would be used to manage the health of the stocks (currently in the healthy zone) should stock status change over time.</p> <p>However, the team notes that well-defined harvest control rules that conform to the precautionary approach for the lobster fisheries have yet to be determined and incorporated within the IFMP.</p> <p>Therefore, the precautionary approach is explicit but not required in the lobster fishery management policy, the assessment team thus considers that 100a is partially met and assigned a score of 90.</p>
References		<p><u>Science</u></p> <ol style="list-style-type: none"> 1. A Framework for the Application of Precaution in Science-based Decision-Making about Risk http://www.pco.bcp.gc.ca/index.asp?lang=eng&page=information&sub=publications&doc=precaution/precaution_e.htm 2. DFO's Oceans Management Approach http://www.dfo-mpo.gc.ca/oceans/management-gestion/index-eng.htm 3. A New Ecosystem Science Framework in Support of Integrated Management http://www.dfo-mpo.gc.ca/science/Publications/Ecosystem/index-eng.htm <p><u>Ecosystem Management</u></p> <ol style="list-style-type: none"> 1. Ecosystem Considerations in Fisheries Management http://www.dfo-mpo.gc.ca/fgc-cgp/documents/parsons_e.pdf 2. Guidelines on Evaluating Ecosystem Overviews and Assessments http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_026_e.pdf 3. Policy for Managing the Impact of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthic-back-

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
	<p><u>fiche-eng.htm</u></p> <p><u>Oceans</u></p> <p>1. Canada's Ocean Strategy – Policy and Operational Framework http://www.dfo-mpo.gc.ca/oceans/publications/cosframework-cadresoc/pdf/im-gi-eng.pdf</p> <p><u>Fisheries Management</u></p> <p>1. Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>2. A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm</p> <p>3. Policy on Managing Bycatch http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/bycatch-policy-prise-access-eng.htm</p> <p>4. Application of the Sustainable Fisheries Framework through the Integrated Fisheries Management Planning Process http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/ifmp-pgip-back-fiche-eng.htm</p>
OVERALL PERFORMANCE INDICATOR SCORE:	90
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 3.1.4

For all 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	Y
		<p>The management system for all 4 Units of Certification provides for a range of 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.</p> <p>The Assessment Team noted that a considerable number of incentives have been adopted and are in use to ensure both the sustainability of the fishery and prevent perverse incentives from arising. The team acknowledges that while several of the incentives listed in the main report fall within the category of management measures and are supported by enforceable regulations and licence conditions, many of them were put in place at the request of lobster licence holders and with their endorsement, a clear indication of their commitment to sustainable fishing practices, and the protection of lobster habitats and ecosystems.</p> <p>DFO's management system explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices. Regular (post-fishery) reviews are conducted internally within DFO (eg. to update DFO's Fishery Sustainability Checklist) and externally with affected stakeholders through the established lobster advisory committee processes (eg. when evaluating the performance of the fishery's policies and management measures).</p> <p>No apparent capital or operating subsidies are known to be offered by governments to the harvesting sector that would give rise to outcomes that are inconsistent with these principles.</p> <p>The Assessment Team concludes that a score of 100 is warranted for all 4 Units of Certification.</p>		
References		Refer to the assessment report for a description of the incentives in place for the fishery.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 3.2.1

UoC 1

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	Y	Y
Justification		<p>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.</p> <p>The approved IFMP as provided to the assessment team identifies 4 specific objectives for the SGSL lobster fisheries. They are: stock conservation, ecosystem, stewardship, and social/cultural/economic. These objectives are broadly consistent with achieving the outcomes expressed by the MSC's Principles 1 and 2 and are therefore implicit within the fishery's management system.</p> <p>The fishery specific objectives are further informed by supporting activities (or outcome statements) that are set out over the short, medium and long term. The IFMP Performance Review section identifies indicators that serve to assess progress in achieving the short, medium and long-term objectives, and they are explicitly stated in the IFMP.</p> <p>Therefore the assessment team considers that SG100 is met.</p>		
References		DFO 2014c. Integrated Fisheries Management Plan for Lobster in the Southern Gulf of St Lawrence, Lobster Fisheries Areas 23, 24, 25, 26A and 26B. DFO Gulf Region.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				NA

UoCs 2, 3, 4

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	Y	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 explicit within the fishery's management system.</p> <p>The lobster IFMP for Units of Certification 2, 3 and 4 was approved in 2011. It contains clear, specific objectives for the fishery that are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, and are explicit within the fishery's management system.</p> <p>The objectives are translated into practical terms through the definition of strategies that define what is being done to manage pressures imposed by fishing activities in order to control their impact on fish population and ecosystem attributes. Tactical management measures have also been defined to guide how the strategies will be implemented to manage the pressures imposed by fishery activities.</p> <p>The IFMP's objectives for the lobster fishery have not been well-defined as being short term and long term, nor have associated timeframes been attributed. While the Assessment Team is satisfied that the objectives are very likely measurable based on the IFMP's tactical measures, it found no evidence to conclude that the objectives were demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2.</p> <p>Therefore, 100a is not met.</p>
References		DFO 2011a. Integrated Fishery Management Plan for Inshore Lobster in Lobster Fishing Areas 27-38. Scotia-Fundy Sector. DFO Maritimes Region.
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.2

UoC 1

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	
		<p>There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>The management system for the NB and NS lobster fisheries is supported by federal statutes and regulations that are designed to achieve positive conservation outcomes for the target stock and associated habitat and marine ecosystems. The legislation is supported by management policies and implementation guidelines/tools which support the objectives identified for the lobster fishery.</p> <p>There are established decision-making processes in place that will result in measures and strategies to achieve the fishery-specific objectives defined in the IFMP. Ministerial agreement is required when important adjustments are required for key commercial fisheries, including lobster, that are inter-regional or inter-provincial in scope. The associated decision-making processes are described in detail in the main report. While the processes are not explicitly defined and published, they are nonetheless long-standing in their application and are considered by stakeholders and the Assessment Team to be reasonably effective that will result in measures and strategies to achieve the fishery-specific objectives of the management system.</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.		
		<p>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.</p> <p>It is important to note that there has been an absence of serious issues that would compromise the objectives established for the lobster fisheries for which the DFO has jurisdictional responsibility and authority. Lobster landings are at historical highs in all LFAs and indicators of abundance and reproductive health are stable or increasing. There has not been any reported food safety or public health issues in recent years.</p> <p>That said, the decision-making processes are conditioned to operate effectively, transparently, and in a timely manner should serious and other issues arise that would affect the management system and fishery-specific objectives. The processes operate on a continuous cycle of internal post-season review, stakeholder input, in-season scientific research, and compliance monitoring. As described in the main report, there are a number of scientific partnerships and networks in place through which organizations conduct a wide-range of studies of specific application to lobster stocks, their habitat and ecosystem. Occasionally, the decision-making processes are informed by observations raised through independent, external reviews.</p> <p>The fisheries management and science processes are supported by well-established and functioning industry consultation and engagement activities, both formal and informal, which contribute to promoting decision-making that is effective and responsive to any potential serious and other important issues. During the April 2014 site visit, a number of harvester organizations indicated that potential disputes are frequently avoided because the underlying issue is examined proactively at the local level thus removing potential misunderstandings.</p> <p>The Assessment Team was made aware that in a few areas of UoC 1, some aspects of the management decision-making process was judged by harvesters to have been somewhat slow to react on occasion when they sought changes to policy (such as licensing policy) that were intended to improve their economic outcomes from the fishery or promote increased sustainability. Here, the DFO decision-making process sought "consensus" from harvester representatives from the affected ports or other adjoining ports before a decision was rendered. "Consensus" was not defined, resulting in decisions being set aside even when a majority of harvesters voted in support of the policy change.</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 precautionary approach for fisheries management is defined in a number of DFO national frameworks including in the IFMPs for the lobster fishery. The approach means being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem.</p> <p>The precautionary approach model has been developed for the SGSL lobster fisheries and has been peer-reviewed and will be published shortly. Reference points have been determined and work is progressing on refining harvest control rules (no specific timeframe identified). The IFMP indicates that, in the interim period, the fishery will continue to be managed with caution.</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
	<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>Stakeholders are able to access a range of information on the performance of the fishery and management actions through a variety of means, such as by attending regional and local lobster advisory committee meetings, enforcement roundtables, and subject-matter workshops, published reports, news services, and from various government-industry-corporate websites.</p> <p>Information initiated and formally provided by DFO includes stock status and research priorities and outcomes, economic analyses of conditions and trends affecting the fishery and industry, enforcement and compliance priorities and outcomes, fisheries management policy changes, regulatory amendments, species at risk assessments and recovery plans, environmental findings etc. Independent fisheries reviews are also available electronically and via media outlets.</p> <p>DFO personnel routinely provide explanations at meetings for any actions or lack of action associated with various findings and relevant recommendations. This extends to industry associations who make the information available to their membership.</p> <p>Federal Access to Information requests offer another means of obtaining information and analyses provided by governments.</p> <p>However, a N was assigned to 100d as there is no clear evidence of this type of formal reporting taking place and also the fishery-specific objectives to formally evaluate the fishery performance against has been recently (2014) adopted in the fishery management system.</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>The management authority or the fishery is not subjected to continuing court challenges, and respects court decisions that are handed down. On occasion, DFO will consider appealing a provincial or federal lower court decision if, for example, it has been determined that a serious error has arisen or if the decision has the potential to seriously limit the Minister's discretionary powers pursuant to the federal <i>Fisheries Act</i>.</p> <p>The management system or fishery does comply in a timely fashion with judicial decisions arising from any legal challenges (this usually includes while awaiting the disposition of a decision under appeal).</p> <p>In the majority of cases, the management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. DFO's formal and informal consultation and engagement processes have been effective in minimizing potential legal disputes involving other levels of government, industry stakeholders and the general public. Of note, Fishery Officers have the authority to intervene to resolve conflicts between fishers outside of the legal system.</p>
References		<p>Refer to the background for a complete description of the decision-making processes in place for the fishery.</p> <p>DFO 2014c. Integrated Fisheries Management Plan for Lobster in the Southern Gulf of St Lawrence, Lobster Fisheries Areas 23, 24, 25, 26A and 26B. DFO Gulf Region.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		NA

UoCs 2, 3, and 4

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
a	Guidelinepost	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

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>There are established decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>The management system for the NB and NS lobster fisheries is supported by federal statutes and regulations that are designed to achieve positive conservation outcomes for the target stock and associated habitat and marine ecosystems. The legislation is supported by management policies and implementation guidelines/tools which support the objectives identified for the lobster fisheries of UoCs 2, 3 and 4.</p> <p>There are established decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives in accordance with the approved IFMP for the lobster fisheries in question. Ministerial agreement is required when important adjustments are required for key commercial fisheries, including lobster, that are inter-regional or inter-provincial in scope. The associated decision-making processes are described in detail in the main report. While the processes are not explicitly defined and published, they are nonetheless long-standing in their application and are considered by stakeholders and the Assessment Team to be reasonably effective that result in measures and strategies to achieve the fishery-specific objectives of the management system.</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.		
		<p>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.</p> <p>It is important to note that there has been an absence of serious issues that would compromise the objectives established for the NB and NS lobster fisheries for which the DFO has jurisdictional responsibility and authority. Lobster landings are at historical highs in all LFAs and indicators of abundance and reproductive health are stable or increasing in the majority of the LFAs. There has not been any reported food safety or public health issues in recent years.</p> <p>That said, the decision-making processes are conditioned to operate effectively, transparently, and in a timely manner should serious issues arise that would affect the management system and fishery-specific objectives. The processes operate on a continuous cycle of internal post-season review, stakeholder input, in-season scientific research, and compliance monitoring. As reported in the main report, there are a number of scientific partnerships and networks in place through which organizations conduct a wide-range of studies of specific application to lobster stocks, their habitat and ecosystem. Occasionally, the decision-making processes are informed by observations raised through independent, external reviews.</p> <p>The fisheries management and science processes are supported by well-established and functioning industry consultation and engagement activities, both formal and informal, which contribute to promoting decision-making that is effective and responsive to any potential serious and other important issues. During the April 2014 site visit, a number of harvester organizations indicated that potential disputes are frequently avoided because the underlying issue is examined proactively at the local level thus removing potential misunderstandings.</p> <p>In one LFA of UoC 4, the fisheries management decision-making process was characterized by the harvester representatives as being somewhat slow to react on occasion when they sought important changes to policy (such as licensing policy) that were intended to improve their economic outcomes from the fishery or promote increased sustainability. As reported, the DFO decision-making process sought "consensus" from harvesters from the affected LFA or other adjoining LFAs before a decision was rendered. "Consensus" was not defined, resulting in the decision being put aside even when a majority of harvesters had voted in support of the policy change.</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 precautionary approach for fisheries management is defined in a number of DFO national frameworks including in the IFMPs for the lobster fishery in all 3 UoCs. The approach means being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem.</p> <p>The precautionary approach model for lobster fisheries has been peer-reviewed and published. Reference points have been determined and work is progressing on refining harvest rules. The IFMP indicates that, in the interim period, the fishery will continue to be managed with caution.</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	Y
	Justification	<p>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.</p> <p>Stakeholders are able to access a range of information on the performance of the fishery and management actions through a variety of means, such as by attending regional and local lobster advisory committee meetings and subject-matter workshops, published reports, news services, and from various government-industry-corporate websites.</p> <p>Information initiated and formally provided by DFO includes stock status and research priorities and outcomes, economic analyses of conditions and trends affecting the industry, enforcement and compliance priorities and outcomes, fisheries management policy changes, regulatory amendments, species at risk assessments and recovery plans, environmental findings etc. Independent fisheries reviews are also available electronically and via media outlets. The fishery-specific objectives for the lobster fisheries are set out in the IFMP with supporting strategies and tactical measures, all of which allow for the performance of the fishery to be assessed and formally reported to interested stakeholders.</p> <p>DFO personnel routinely provide explanations at meetings for any actions or lack of action associated with various findings and relevant recommendations. This extends to industry associations who make the information available to their membership.</p> <p>Federal Access to Information requests offer another means of obtaining information and analyses provided by governments.</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>The management authority or the fishery is not subjected to continuing court challenges, and respects court decisions that are handed down. On occasion, DFO will consider appealing a provincial or federal lower court decision if, for example, it has been determined that a serious error has arisen or if the decision has the potential to seriously limit the Minister's discretionary powers pursuant to the federal <i>Fisheries Act</i>.</p> <p>The management system or fishery does comply in a timely fashion with judicial decisions arising from any legal challenges (this usually includes while awaiting the disposition of a decision under appeal).</p> <p>In the majority of cases, the management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. DFO's formal and informal consultation and engagement processes have been effective in minimizing potential legal disputes involving other levels of government, industry stakeholders and the general public. Of note, Fishery Officers have the authority to intervene to resolve conflicts between fishers outside of the legal system.</p>
References		<p>Refer to the background for a complete description of the decision-making processes in place for the fishery.</p> <p>DFO 2011a. Integrated Fishery Management Plan for Inshore Lobster in Lobster Fishing Areas 27-38. Scotia-Fundy Sector. DFO Maritimes Region.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.3

For all 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	
b	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.</p> <p>The MCS system for the NB and NS lobster fisheries is considered multi-faceted and comprehensive, consisting principally of dockside and at-sea vessel and harvester inspections, aerial and sea surveillance, and covert operations. These activities are supplemented by effective stakeholder engagement activities/roundtables, public awareness and educational initiatives, as well as a proactive approach to investigating complaints and tips from industry and the general public.</p> <p>The C&P program is informed by a compliance and enforcement strategy for the fishery that is adjusted by a recurring planning, priority-setting, monitoring and evaluation function. Compliance risks are assessed against a mitigation strategy consisting of enforcement activities and tools that are intended to ensure compliance with the requirements of the management system and measures for the fishery. C&P program input and outcome data for the 2011 to 2013 period demonstrate a consistent capacity to enforce relevant management measures, strategies and rules for the fishery.</p>			
	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	
	Justification	<p>Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.</p> <p>The management system for the fishery consists of a range of legal and administrative sanctions, including licence suspension, catch and equipment seizures and forfeitures, monetary fines, and incarceration for the most serious offences. Federal prosecutors are experienced in prosecuting fisheries charges, and magistrates have a good understanding of fisheries law. Court-imposed sanctions have been consistently levied year-over-year and which are thought to provide effective deterrence. Media coverage of fisheries prosecutions also serve to reinforce deterrence.</p> <p>While C&P data suggest that the overall MSC system is effective and feedback from stakeholders during the April 2014 site visit is generally positive in regard to the program's performance, the C&P program lacks performance indicators to measure the effectiveness of its activities, including whether sanctions demonstrably provide effective deterrence, preventing the fisheries from meeting 100b.</p>			

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
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.	There is 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.
Met?	Y	Y	Y	
Justification		<p>There is 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.</p> <p>During the April 2014 site visit, lobster fish harvester representatives indicated that they had a relatively high degree of confidence that fishers were compliant with the management system and measures for the fishery. Similarly, harvester organizations routinely provide information of importance to the effective management of the fishery through their participation in a variety of formal and informal advisory and assessment processes. In NB and NS, index fish harvesters regularly provide information and data on the lobster fishery, the results of which are used to inform the stock assessment process and overall monitoring of the effectiveness of the fishery's management measures. For the 2014 commercial fishery in the SGSL, DFO has re-introduced a mandatory logbook reporting requirement supported by an enforceable licence condition. Fishery Officers have been tasked to monitor compliance with the requirement through dockside inspections. During the site visit, DFO further indicated that non-compliance might affect the licence holder's eligibility to renew the lobster licence for the following year.</p>		
d	Guidepost		There is no evidence of systematic non-compliance.	
Met?		Y		
Justification		<p>Based on information and program data provided by C&P enforcement staff and comments from industry representatives, the Assessment Team considers the level of recidivism in the fishery to be extremely low. Moreover, there is no evidence to indicate the presence of systematic non-compliance in the fishery.</p>		
References		<p>Feedback provided to the Assessment Team by Industry stakeholders during the April 2014 site visits.</p> <p>Refer to statistical information, analyses and outcomes provided in the main report.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 3.2.4

For all 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	N	N
		<p>Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>DFO's national science and oceans research programs are typically defined by multi-year strategic plans and/or frameworks with appropriate planning imperatives and guidance. Examples include:</p> <ol style="list-style-type: none"> 1. Science Framework for the Future: http://www.dfo-mpo.gc.ca/science/publications/framework-cadre/index-eng.htm 2. New Ecosystem Science Framework in Support of Integrated Management: http://www.dfo-mpo.gc.ca/science/publications/ecosystem/index-eng.htm 3. Framework for Developing Science Advice on Recovery Targets for Aquatic Species in the context of the Species at Risk Act: http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_054_e.pdf 4. Fisheries and Oceans Canada Five-Year Research Plan (2008 - 2013): http://www.dfo-mpo.gc.ca/science/publications/fiveyear-plan-quinquennal/index-eng.html <p>There are numerous documented past and current/ongoing project-specific research initiatives which support the needs of the NB and NS lobster resource, habitat and ecosystem and contribute to the objectives consistent with MSC's Principles 1 and 2. Descriptions of the initiatives are provided in the main report for all three Principles. These initiatives vary in their scope, complexity, duration, objectives and outcomes. Collectively, they provide the management system with ongoing, reliable advice that informs the development of measures and policies consistent with the requirements of the MSC's principles.</p> <p>However, the Assessment Team found no documented evidence to indicate that a formalized regional research plan was developed to provide 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>By extension, there was no documented evidence of a comprehensive research plan that 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, preventing the fisheries from meeting 80a and 100a.</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.

PI 3.2.4		The fishery has a research plan that addresses the information needs of management			
	Met?	Y	Y	N	
	Justification	<p>Research results are disseminated to all interested parties in a timely fashion. DFO-based research results are widely and publicly available on the CSAS website and in scientific journals. The results are also explained to, and discussed with, industry stakeholders and others at formal and informal venues. Related research generated by other government departments, academia, and NGOs is also disseminated on various websites and scientific journals.</p> <p>The absence of a research plan prevents the fisheries from meeting 100b.</p>			
References		Refer to the main report for a listing and descriptions of applicable research initiatives and projects of importance to the needs of management.			
OVERALL PERFORMANCE INDICATOR SCORE:				70	
CONDITION NUMBER (if relevant):				5	

Evaluation Table for PI 3.2.5

For all 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	Y
b	Justification	<p>The fishery has in place mechanisms to evaluate all parts of the management system. The IFMPs for the Southern Gulf and Maritimes commercial lobster fisheries outlines the indicators that will be used to evaluate the performance of the management system. They are listed in the main report. Mechanisms are in place that results in an interactive and consistent exchange of information and opinions between DFO and industry stakeholders. These include regional and local lobster advisory committee meetings where management and policy measures and science initiatives for the fishery are discussed and evaluated; the science-based RAP process provides a retrospective analysis of the fishery's performance and proposals for future changes.</p> <p>All parts of the management system are evaluated as summarized below:</p> <ol style="list-style-type: none"> 1. Precautionary Approach: DFO sustainability checklist (annually) 2. Stock Status: DFO and Industry post-season review (annually); research monitoring (annually) and formal assessment (every 3 years) 3. Ecosystem: DFO and Industry post-season review (annually); research monitoring (annually) 4. Enforcement and Compliance: DFO and Industry post-season review and local roundtables (annually) 5. Economics: DFO Cost-Earnings analyses (as required) 6. Management Measures: DFO and Industry post-season review (annually) and local advisory committee meetings (ongoing) 7. Licensing Policy: DFO regional committee and industry engagement (annually) 		
	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.
c	Met?	Y	Y	N
	Justification	<p>The fishery-specific management system is subject to regular internal and occasional external review. The internal review mechanisms (defined here as DFO and Industry) are described in the previous section. The external review mechanisms that have been triggered occasionally are listed in the main report.</p>		
References		<p>Refer to main report for details of the internal and external review mechanisms.</p> <p>DFO 2011a. Integrated Fishery Management Plan for Inshore Lobster in Lobster Fishing</p>		

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
	Areas 27-38. Scotia-Fundy Sector. DFO Maritimes Region. DFO 2014c. Integrated Fisheries Management Plan for Lobster in the Southern Gulf of St Lawrence, Lobster Fisheries Areas 23, 24, 25, 26A and 26B. DFO Gulf Region.
OVERALL PERFORMANCE INDICATOR SCORE:	90
CONDITION NUMBER (if relevant):	NA

Appendix 1.2 Risk Based Framework (RBF) Outputs

Appendix 1.2.1 Scale Intensity Consequence Analysis (SICA)

Table 1.2.1.a: Principle 1 SICA Scoring Template Target Species

UoC 1

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score
Target species outcome: American lobster <i>(Homarus americanus)</i>	Directed lobster fishery	3	3	3	Population size		
					Reproductive capacity	2	80 Amended MSC score: 90 (see rational for consequence score)
					Age/size/sex structure		
					Geographic range		
Rationale for selecting worst plausible case scenario	During the RBF meeting held in Moncton, the principal activities creating a risk to the lobster stock were identified as: <ul style="list-style-type: none"> - Directed lobster trap fishery - Poaching and illegal fishing - Rock crab trap fishing - Scallop dredging - “ghost fishing” due to lost trap - “ghost fishing” due to lost gillnets The lobster fishery is a single specific, single gear fishery. Traps are highly selective and there is no highgrading. <u>Scallop dragging</u> : affect lobster habitats, buffer zones (areas closed to dragging), lobster and scallop grounds separated. <u>Poaching and illegal fishing</u> : very small <1% in GNS, overall negligible in NB, less than 20 years ago, not acceptable in the community, shelf-police, public awareness, since 5-10 years harvesters involved in science, LFA 23 localized in some areas. <u>Rock crab fishery</u> : lobster as bycatch, conical traps reduce catching of lobster to a minimal and conical trap is the mean gear type used in the fishery, mandatory to release lobster and survival assumes to be high.						

	<p><u>Trap lost</u>: eliminated due to biodegradable panel in the entire southern Gulf in 2013 (biodegradable twine). <u>Lost gillnets</u>: gillnet clean-up after the fishing season 26-A1, community-based clean-up operations.</p> <p>As a consequence, the Assessment team together with stakeholders has identified the directed lobster trap fishing as the activity which poses the greatest risk to target species, and for scoring under SICA, the interaction between lobster trap fishing and the scoring element lobster (<i>Homarus americanus</i>) has been identified as the worst case scenario.</p>
Rationale for Spatial scale of activity	<p>Fishing activity takes place over the lobster habitat. Traps are distributed on local spots. Fishermen target concentrations of commercial animals; they avoid areas of berried females and juveniles. Based on those observations, and considering the benthic footprint of traps (suggested being less than 1%), stakeholders estimate that the spatial scale of activity is less than 15% of the lobster spatial distribution, giving a score of 2.</p> <p>However, the benthic footprint does not take into account the area of attraction of the bait, which can be 380m², and is not realistic of the actual spatial scale of the activity. It was agreed that a score of 3 (16-30% of the spatial scale covered) is appropriate, considering that the lobster habitats is not entirely covered by traps.</p>
Rationale for Temporal scale of activity	The fishing season is 60 days per year for all LFAs, giving a temporal scale score of 3 (1-100 days per year).
Rationale for Intensity of activity	<p>The intensity of the activity is evaluated on the spatial and temporal scale of the activity, its nature and extent. Catch rates are usually high at the beginning of the season and fluctuates afterward. No clear depletion of the harvestable population can be observed along the fishing. The impact can be locally detectable but not at a large spatial scale. The effect on individual size is detectable at broad scale (truncated size frequency distribution), due to the longevity of the species. The effect on the reproductive capacity is seen to be more important, as the reproduction relies mainly on primiparous females. However there are signs of improvement in the recent years. The abundance of berried females has increased (as shown by CPUEs). The augmentation of the MLS is likely to enhance egg production, which is indicated by the increasing abundance of cohort-1 lobsters in SCUBA surveys.</p> <p>In general, it is agreed there is a moderate detection of activity at a broad scale, which corresponds to a score of 3.</p>
Rationale for choosing most vulnerable sub-component	<p><u>Population size</u></p> <p>Despite high exploitation rate, landings in recent years are in the highest ones recorded in the long time series. CPUEs derived from the recruitment-index program have increased considerably since 2005 (doubled in LFA25, 55% in LFA 26). Densities from trawl surveys increased in 2012 in LFA25 and remained stable in LFA26. Therefore, despite the high fishing intensity, even if an effect exists, the consequence on the population size appears to be minor.</p> <p><u>Lobster size</u></p> <p>Due to the longevity of the species, the consequence of fishing on the size frequency distribution is not negligible. An increase of the abundance of lobsters in the MLS range is observed, but the effect of increased MLS and window size females is not yet detectable for larger sizes. However, this distribution did not prevent the productivity indicators (berried females,</p>

	<p>abundance of pre-recruits and cohort-1 lobsters, increasing CPUE and landings) to remain positive. Possible detectable change in age/size/sex structure is observed but it has a minimal impact on population dynamics. Therefore, the consequence is not minor, but cannot be considered as moderate.</p> <p><u>Geographical distribution</u></p> <p>Despite the high fishing intensity, no detectable negative changes have been observed in the geographic distribution of lobster. Therefore, the consequence of lobster fishery on the geographic range appears to be minor.</p> <p>The reproductive capacity is intimately linked with size distribution. During the RBF meeting, it was agreed to retain <u>reproductive capacity as the subcomponent the most likely to be affected by fishing activity</u>. Since the implementation of conservation measures, after the 1995 FRCC's report, the reproductive capacity was targeted as the major issue, with the aim at increasing the egg production. This resulted in a series of measures, starting in 1998, such a progressive minimum carapace size increase and a maximum legal size.</p>
Rationale for Consequence score	<p>The consequence of fishing on the lobster reproductive capacity is considered as moderate which leads to a score of 2 with a MSC equivalent score of 80. However, as per CC2.3.6.8 "<i>The team may amend a converted MSC score within a scoring guidepost category's 20-point range if there is any additional relevant information available which justifies an amendment</i>", the Assessment team saw appropriate to award an amended score of 90.</p> <p>As mentioned in the Background section of the report, the LFAs under assessment are part of the Southern Gulf of St Lawrence lobster stock (LFAs 23, 24, 25, 26A and 26B) managed as a single unit. The series of management measures implemented to increase the egg production and to enhance the reproductive capacity concerned all LFAs in the SGSL. The objective to increase egg production and to enhance the reproductive capacity resulted in a series of measures, starting in 1998, in order to allow the expansion of the brood stock:</p> <ol style="list-style-type: none"> 1) The minimum carapace size was progressively increased since 1997. At that time the MLS were 63.5 mm in LFA 24, 65.1 mm in LFA 26, and 66.7 mm in LFA 25. MLS are now set at 50% maturity size (72 mm) for these LFAs. In LFA 23, The MLS was progressively increased from 66.7 mm in 1996 to 76 mm (23A, 23B), 73 mm (23C), and 72 mm (23D) in 2013. In LFA 26B, the MLS was progressively increased from 70 mm in 1996 to 81 mm (26B North) and 79 mm (26B South) in 2013. 2) A "window size" was implemented in 2003 for areas 23, 24 and 26A. It means that all female lobsters having a CL between 115 and 129 mm must be returned to the water. In LFA 25, a maximum female size of 114 mm was implemented. Between 2003 and 2005, male lobster larger than 129 mm CL in LFA 25 also had to be released. 3) The nominal fishing effort was also reduced. The number of traps per license was reduced by 91%, and the number of traps by 12.3% from 2006 to 2012 for all combined LFAs.

	<p>The effect of those conservation measures was assessed. In Newfoundland, it was found that a "slot fishery" (i.e. minimum and maximum legal size), as implemented in LFA 25, was one of the most efficient tool to improve the reproductive value (i.e. the quantity of eggs that an individual is able to produce during its life time). The window size was seen as much less efficient, as the reproductive value increased by 2%. However, a tagging experiment, conducted in LFA 26, has demonstrated that the window size was an effective conservation measure. In that area, the protected females represented 10% of the total berried females and 23% of the total egg production. It was also estimated that the smallest protected females could reproduce 4 times before being available to harvest. The window size would also avoid letting the primiparous females being the principal spawners.</p> <p>It is therefore possible to estimate that both the minimum legal size and the window, size together, are able to protect, to some extent, the reproductive capacity of the lobster stock.</p> <p>As a result of those measures, an increase of berried females was observed in all LFAs. In at sea sampling, peaks of berried females per trap was multiplied by 3 (0.04 to 0.12) in sub-regions 25N, between 2003 and 2012. The size structure has also expended slightly as a mode at 85 mm appeared. Trawl surveys also indicate that the abundance of pre-recruit lobsters has increased during the recent years, suggesting an improvement of the reproductive capacity.</p> <p>In conclusion, based on fishery dependent indices, there is an increase in abundance of berried females in all LFAs of the SGSL. Egg production, expressed as the index of berried females from at-sea sampling, has increased in most monitored areas over the past decade. The abundances of 1-yr old lobsters have increase dramatically in the SGSL as the global mean abundance increased by more than 6.5 fold, from 2.0 lobster/400 m² in 2003 to 13.1 lobster/400 m² in 2012. Increasing the MLS, in order for females to reach SOM50, and the protection of large and fecund window-size females (maximum size in LFA 25) seemed to have favored higher recruitment.</p> <p>The two multi-year management plans aimed at increasing egg production through increases in MLS and the protection of large females seem to have had a positive effect on lobster production in the 5 LFAs within the DFO Gulf Region.</p>
--	---

UoC 2

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score
Target species outcome: American lobster	Directed trap fishery	3	3 (27-32) 4(33)	3	Population size		
					Reproductive capacity	2 (LFA 33)	80

(Homarus americanus)					Age/size/sex structure	2 (LFAs 27-32)	80
					Geographic range		
Rationale for selecting worst plausible case scenario	<p>During the RBF meeting held in Halifax, the principal activities creating a risk to the lobster stock were identified as:</p> <ul style="list-style-type: none"> 1) Directed trap fishery 2) Scallop dragging 3) Harbour dredging 4) Illegal fishing 5) First Nations fishery 6) Finfish farms 7) Ghost fishing due to lost gillnets 8) Ghost fishing due to lost traps 9) Seismic activities <p>2) Small lobsters are known to settle on scallop's grounds, and the actual effect is not known. However, scallop dragging occurs mainly in offshore areas. Fishery takes place in designated areas and a rotation system between fishing areas is in place. Scallop activities are designed to minimise impact on lobster. Observer data from the inshore scallop fishery in SFA 29 showed that the number of lobsters caught was very small (<0.1%) compared to global catch. Therefore, the impact is perceived as minimal.</p> <p>3) Harbour dredging is intense but very localized (mainly in Sydney harbour). Dredging activities are very low elsewhere and the global impact is negligible.</p> <p>4) Illegal fishing is mainly due to self-consumption. It still occurs but is not as important as several years ago. There is a strong social control ("self-police") and illegal fishing is now socially unacceptable. At present, the impact is considered As minimal.</p> <p>5) First Nations fishery (LFAs 28 and 29) for ceremonial purposes is not really controlled and the amount caught is not known. However, stakeholders and DFO scientists consider those catches insignificant compared to the global catch fishery and have a negligible impact.</p> <p>6) Finfish farming is a concern for lobster fishers. The potential impacts on habitat and caused by the releases of chemicals are not known. The risk is seen as potentially high however it should be localized.</p> <p>7) The risk created by lost gillnets still exists. Gillnet fisheries is less important than in the past (no more mackerel fishery). The global effect of those losses appears to be minimal.</p>						

	<p>8) Gear loss is not quantified regularly but is believed to be low as gear is valuable and efforts are made to recover lost traps through grappling. Due to the compulsory biodegradable twine, ghost fishing by lost traps is considered as inexistent at present. The global impact is negligible.</p> <p>9) Seismic activities occurring in oil and gas exploration may be detrimental for larvae. Activities are designed to minimise the risk as they take place outside concentrations and reproduction periods. The impact on lobster stock is seen as minimal.</p> <p>As a consequence, the Assessment team together with stakeholders has identified the directed lobster trap fishing as the activity which poses the greatest risk to target species, and for scoring under SICA, the interaction between lobster trap fishing and the scoring element lobster (<i>Homarus americanus</i>) has been identified as the worst case scenario.</p>
Rationale for Spatial scale of activity	Fishing activity takes place over the lobster habitat. Traps are distributed on local spots. Fishermen target concentrations of commercial animals; they avoid areas of berried females and juveniles. The benthic foot print of traps is less than 0.5% of the total fishing area. When considering attraction area (about 350m ² /trap), the total surface fished remains below 15%. Fisher does not cover the entire spatial lobster distribution and refuges exist. Stakeholders estimate that the area fished is between 1 and 15% of the geographical distribution of lobster (score 2). However, to be conservative, the assessment team estimates that the area is between 15 and 35%, which leads to a score of 3.
Rationale for Temporal scale of activity	The fishing season is 60 days per year for LFAs27-32, giving a temporal scale score of 3 (1-100 days per year). For LFA 33, fishing season is between 100 and 200 days per year, giving a score of 4.
Rationale for Intensity of activity	Effect of fishing is detectable, as catch rates are declining throughout the season. This effect is localized in space as it is not observed everywhere, and catch rates return to high values the following season. The stock is maintained at high levels. The intensity is therefore considered as moderate, which corresponds to a score of 3.
Rationale for choosing most vulnerable sub-component	<p><u>Geographical distribution</u></p> <p>Despite the high fishing intensity, no detectable negative changes have been observed in the geographic distribution of lobster. Therefore, the consequence of lobster fishery on the geographic range appears to be minor.</p> <p><u>Population size</u></p> <p>LFA 27 - Landings in 2010 (2,568 t) and the mean for the last 3 years (2,532 t) were above the median for 1985-2004 (1996). Abundance indicators for sublegal and legal sizes based on standard traps deployed by the Fishermen and Scientists Research Society (FSRS) are positive overall.</p> <p>LFAs 28-32 - Landings in 2010 (3,866 t) and the mean for the last 3 years (4,224 t) were well above the median for 1985-2004 (822 t). Abundance indicators for sublegal and legal sizes based on standard traps deployed by the FSRS are positive and well above levels seen in earlier periods. A CPUE index for legal sizes followed the sublegal index trend, increasing from 2004 to 2009, with the mean of the last 3 years 1.7 times the median for 2000-2007.</p> <p>LFA 33 - Landings for the 2009-2010 season (3,377 t) and the mean for the last 3 years (3,126 t) were above the median for</p>

	<p>1984-1985 to 2003-2004 (2,071 t). A temperature-corrected abundance index for sublegals (76-80 mm CL) increased from 1999-2000 to 2008-2009 and the mean for the two seasons ending in spring 2009 was 1.3 times the median of the period 1999-2000 to 2006-2007.</p> <p>Overall, the indicators of population size are positive and increasing. The consequence of fishing on population size appears minor.</p> <p><u>Size/age/sex structure</u></p> <p>No changes in the sex structure are observed.</p> <p>Due to the longevity of the species, the consequence of fishing on individual size is not negligible. The fishing pressure induces a shrinkage of the size distribution. The fishery depends, at most part, on recruited individuals. Size structure is considered as the most vulnerable component for LFAs 27-32.</p> <p><u>Reproductive capacity</u></p> <p>Reproductive capacity and size structure are linked. Since the 1995 FRCC's report, conservation efforts were directed to address the reproductive capacity issue. In LFAs 27-31, the reproductive capacity is not considered as an issue anymore, as primiparous females are fully protected: MLS above size at 50% maturity, maximum hoop size, maximum female size, window female size, V-notching. Standardized CPUEs of berried females, derived from voluntary logs, has increased significantly since 2005 (from 0.2 to 0.6 in LFAs 27 and 30, 0.1 to 0.4 in LFA 31. However, unpublished data on lobster maturity for LFA 32 from 2011 indicates SOM_{50} to be 89 mm, which is above the MLS of 82.5 mm. However, standardized CPUEs of berried females in LFA 32 has also increased since 2005 (0.05 to 0.1). In Newfoundland, minimum and maximum legal sizes ("slot fishery", area 30) were considered as the most efficient conservation tool. V-notching is quite as efficient. In areas 32 and 31b, the total number of released v-notched females is about 300,000, which have been able to increase the amount of eggs produced.</p> <p>An egg index calculated for area 31a shows a large increase in egg production from less than 500 (legal size), in 2002, to around 2500 (legal size) and 1500 (sublegal size) in 2010. That index also indicates that the reproductive capacity does not rely exclusively on primiparous females.</p> <p>However, in area 33, the reproductive capacity remains at risk, as the MLS is still below the size at maturity.</p> <p>As determined during the RBF meeting the retained most vulnerable components are:</p> <ul style="list-style-type: none"> - areas 27-32, size structure; - area 33, reproductive capacity.
Rationale for Consequence score	Size structure - areas 27-32 Data from FSRS trap sampling and from at-sea sampling indicate that the size structure has remained close to the minimum legal size since 2004. Some positive trends are observed. In LFA 27, the median sizes have increased since 1997 (80 to 87 mm) due to increases in the Minimum Legal Size (MLS). The median sizes in LFA 29 decreased from 1999 to 2005 but

	<p>increased from 2007 to 2009 (90 to 93 mm). LFAs 31A and 31B showed similar decreases until 2007 (at-sea sample data were not accessed for the most recent years). No trend was observed in LFA 32. A decrease in the median size is consistent with increasing recruitment as larger numbers of lobsters are recruited to legal size. This assumption is consistent with the global increase of abundance indicators. In the LFAs 28-32, CPUEs from voluntary logs increased since 1990. The rate of increase was greatest in LFA 31a (around 0.20 to 1.40 kg/haul). In LFA 27, CPUEs increased from 0.25 to 0.4 kg/haul, in the south, and from 0.30 to 0.55 in the north. In LFA 32, the increase was from .020 to 0.45 kg/haul. In LFA 33, CPUEs increased from 0.15 to 0.30 kg/haul, in the east, and from 0.30 to 0.55 in the west. In LFA 31a and 32 the present CPUE levels are the highest in the series. For the same areas, CPUEs from mandatory logs show a slight increase since 2004. In LFA 27, CPUEs from mandatory logs increased a small amount over the 2004-2010 period with 2010 1.1x the 7 year median.</p> <p>In conclusion, the consequence of fishing on the size structure is not negligible. Considering the slight increase in the median size and the increasing abundance of lobsters, it is possible to determine that changes in size are observed but there is a minimal impact on population size and none on dynamics.</p> <p>The consequence is considered as moderate, which leads to a score of 2, with a MSC equivalent score of 80.</p> <p><i>Reproductive capacity – area 33</i></p> <p>The minimum legal size was increased from 81 mm in 1998 to 82.5 mm in 2007, but still remains under the, the size at 50% maturity, estimated around 90-95 mm carapace length. As a result, 70% of primiparous females are protected.</p> <p>Despite that difference, stock status indicators are positive.</p> <p>Mean exploitations rate (0.67) for the period 2007-2010 is below the median for 1999-2000 to 2006-2007 (0.76). Mean landings of the 2006-2010 period (3,126 t) were above the median for 1984-1985 to 2003-2004 (2,071 t), and well above the proposed Upper Limit Reference point (1,838t). It is thought that the recent increases in landings are primarily due to an increase of the CPUE (and presumably abundance) and not to an increased fishing effort.</p> <p>Data derived from voluntary log-books suggest a long-term increase in the CPUE (no per trap haul/fisherman/yr) of ovigerous females in LFA 33 (around 0.01 for 1985-1995, and above 0.02 in 2010). CPUEs of FSRS Recruitment Traps provide strong evidence of an increase in the abundance of ovigerous females.</p> <p>A temperature-corrected abundance index for sublegals (76-80 mm CL) increased from 1999-2000 to 2008-2009 and the mean of the two seasons ending in spring 2009 was 1.3 times the median of the period 1999-2000 to 2006-2007. Unstandardized CPUE of sublegals in FSRS traps increased from the 2000-01 season. The mean for the last 3 yr (2.81 for weighting by landings, 2.39 for weighting by shoreline length) is 1.15-1.20 times the median for 1999-2007 (2.43 and 1.99). A temperature-corrected index also showed a substantial increase in the abundance of prerecruit lobsters from 1999 to 2009 (from 1.00 to 1.92).</p> <p>In conclusion, there are possible detectable changes in reproductive capacity but the impact is minimal on the dynamics of the stock. The consequence is considered as moderate, which leads to a score of 2, with a MSC equivalent score of 80.</p>
--	---

	The consequence score for the UoC 2 is therefore 2, with a MSC equivalent score of 80.
--	--

UoC 3

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score			
Target species outcome: American lobster (<i>Homarus americanus</i>)	Directed trap fishery	4	4	4	Population size					
					Reproductive capacity	2	80			
					Age/size/sex structure					
					Geographic range					
Rationale for selecting worst plausible case scenario	During the RBF meeting held in Halifax, the principal activities creating a risk to the lobster stock were identified as:									
	<ol style="list-style-type: none"> 1) Directed trap fishery 2) Scallop dragging 3) Ghost fishing tangle nets 4) Ghost fishing lost traps 5) Fishing farms 6) Groundfish dragging 7) Illegal fishing 8) Seismic activities <p>2) Small lobsters are known to settle on scallop's grounds, and the actual effect is not known. However, scallop dragging occurs mainly in offshore areas. Fishery takes place in designated areas and a rotation system between fishing areas is in place. Scallop activities are designed to minimise impact on lobster. Therefore, the impact is perceived as minimal.</p>									

	<p>3) Tangle nets are used to target groundfish in general. There are few overlaps between lobster grounds and groundfish areas. The impact is seen as negligible, especially with the reduction on cod fishery.</p> <p>4) Gear loss is not quantified regularly but is believed to be low as gear is valuable and efforts are made to recover lost traps through grappling. Due to the compulsory biodegradable twine, ghost fishing by lost traps is considered as nonexistent at present. The global impact is negligible.</p> <p>5) Finfish farming is a concern for lobster fishers. The potential impacts on habitat and caused by the releases of chemicals are not known. The risk is seen as potentially high however it should be localized.</p> <p>7) Illegal fishing is mainly due to self-consumption. It still occurs but is not as important as several years ago. There is a strong social control ("self-police") and illegal fishing is now socially unacceptable. At present, the impact is considered As minimal.</p> <p>Removals of lobster by means other than the commercial fishery are partially documented or undocumented, but are thought to be low relative to the commercial fishery.</p> <p>8) Seismic activities occurring in oil and gas exploration may be detrimental for larvae. Activities are designed to minimise the risk as they take place outside concentrations and reproduction periods. The impact on lobster stock is seen as minimal.</p> <p>As a consequence, the Assessment team together with stakeholders has identified the directed lobster trap fishing as the activity which poses the greatest risk to target species, and for scoring under SICA, the interaction between lobster trap fishing and the scoring element lobster (<i>Homarus americanus</i>) has been identified as the worst case scenario.</p>
Rationale for Spatial scale of activity	The fishery is widely distributed over lobster habitat, but fishers target concentrations of commercial animals. Some areas are less fished, to avoid juveniles and berried females. The estimated percentage of the area of the LFAs contacted by lobster traps was low (<0.1%). In the nearshore portion of LFA 34, the total area in contact is higher but still less than 0.2% of the total area. Taking attractive influence of traps (around 350 m ²), it is estimated that actual fishing grounds cover a third of the geographical distribution of lobster, which leads to a score of 4.
Rationale for Temporal scale of activity	The fishing season varied between 100 and 200 days, which corresponds to a score of 4.
Rationale for Intensity of activity	Effect of fishing is detectable. Size distribution is quite narrow. Catch rates are declining during the season. This effect is localized in space as it is not observed everywhere; in some areas the effect is minor. The stock is maintained at high levels. Overall, the intensity is considered as major, corresponding to a score of 4.
Rationale for choosing most vulnerable sub-component	<p><u>Geographical distribution</u></p> <p>Despite the high fishing intensity, no detectable negative changes have been observed in the geographic distribution of lobster. Therefore, the consequence of lobster fishery on the geographic range appears to be minor.</p> <p><u>Population size</u></p> <p>Lobster landings in 2011/12 (23,292 t) are a record high at 2.7 times the 50-year annual mean (1961 to 2010: 8,575 t), and</p>

	<p>are 1.4 times higher than 2004/05. Commercial catch per unit effort (CPUE) in 2011/12 (1.1 kg/trap haul) increased substantially from 2004/05 (0.74 kg/trap haul) and from 1998-99 (0.58 kg/trap haul). Overall, the indicators of population size are positive and increasing. The consequence of fishing on population size appears minor.</p> <p><u>Size/age/sex structure</u></p> <p>No changes in the sex structure are observed.</p> <p>Due to the longevity of the species, the consequence of fishing on individual size is not negligible. The fishing pressure induces a shrinkage of the size distribution. Downward shifts in size structure were evident for some areas in the nearshore and midshore. There was no indication of a downward shift in size structure in the offshore. The fishery depends, at most part, on recruited individuals. Size structure is considered as a vulnerable component.</p> <p><u>Reproductive capacity</u></p> <p>Reproductive capacity is perceived as the most vulnerable component, linked to the size structure. Size at onset of 50% maturity was estimated at 96.5 mm carapace length. As the minimum legal size is 82.5 mm, only a small portion of females below the minimum legal size reach maturity.</p>
Rationale for Consequence score	<p>The size of female lobsters shows different trends according to the fishing area. The mean size, derived from at-sea sampling of the commercial catches, is more or less constant since 1990 around 85-90 mm CL. However, a diminution of the largest females is more evident. The 95th percentile of female size (the largest ones) is smaller in traps set in the nearshore and in some areas of the midshore. In the offshore, there was no consistent trend. According to port sampling, for the period 2006-2012, a decline in large female representation is observed everywhere: from around 130 mm to 100 mm in the offshore, from 110 mm to 95-100 mm in the midshore, and from around 110 mm to 95 mm in the nearshore areas.</p> <p>A model to estimate indices of the potential egg production was calculated. The egg production for subareas of the nearshore and midshore for the most recent time period showed no increase relative to the 1990-1995 time period. In the midshore, the size category that contributed the most to the reproductive potential shifted down from medium size (100-120 mm CL) to lobster smaller than 100 mm CL. In the nearshore, the medium size was also the biggest contributor to reproductive potential and observed egg contribution historically, but its contribution was substantially lower for the most recent period.</p> <p>Despite those trends, the stock production appears to remain high.</p> <p>Landings are constantly above 15,000 t since 2000, and, in the season 2011-2012, they were the highest of the time series (23,292 t).</p> <p>The average commercial CPUE of the last two years (1.1 kg/trap haul) is 1.7 times that of 1998-99 and 1999-00 (0.6-0.7 kg/trap/haul). This increase in CPUE accounts for the increased landings over the same time period.</p> <p>The standardized CPUE models indicate indicates CPUE in the nearshore of LFA 34 has been higher in the last 3 seasons (2009-10, 2010-11 and 2011-12) than in the previous 10 seasons. CPUE corrected for temperature for LFA 34 nearshore</p>

	<p>indicates the abundance of sublegal lobsters has been higher in the last 2 seasons (2010-11 and 2011-12) than the previous 11 seasons.</p> <p>A precautionary approach proposed for lobster in LFA 34 utilizes reference points for the abundance of legal sizes (landings, commercial catch rate) and the abundance of legal and sublegal sizes combined (ITQ survey). These indicators are above their Upper Stock References (USR), indicating that the lobster stock in LFA 34 is in the healthy zone:</p> <ul style="list-style-type: none"> - Landings-based reference points are based on the median of lobster landings from 1985-2009. The Upper Stock Reference (USR) is 8,867 t. The 3-year running mean of landings is 21,147 t for the season ending 2011-12, putting LFA 34 lobster in the healthy zone, well above this USR. - A proposed USR based on commercial CPUE is 80% of the median CPUE for the period 1998-99 to 2008-09. The current 3-year running mean (1.0 kg/trap haul) is well above the USR (0.62 kg/trap haul). - A proposed fishery independent USR for legal and sublegal lobster abundance is 80% of the median catch rate in the ITQ survey for the period 1996-2009. The current 3-year running mean (71.9) is well above the USR (19.0 lobsters per tow). <p>According the 2013 Science Advisory Report, high ER in the nearshore portion of LFA 34 have not inhibited the substantial increases in lobster abundance in the last 10-12 years. Given that environmental conditions remain favorable for lobster, the current levels of fishing effort do not appear to threaten the sustainability of lobster stocks in LFA 34.</p> <p>It is therefore possible to detect change in reproductive capacity but the impact on population dynamics appears minimal, which leads to a consequence score of 2, equivalent to a MSC score of 80.</p>
--	---

UoC 4

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score
Target species outcome:	Directed trap fishery	4	4	3	Population size		
American lobster (<i>Homarus americanus</i>)					Reproductive capacity	2	80
					Age/size-sex structure		
					Geographic range		

Rationale for selecting worst plausible case scenario	<p>During the RBF meeting held in Halifax, the principal activities creating a risk to the lobster stock were identified as:</p> <ul style="list-style-type: none"> 1) Directed trap fishery 2) Illegal fishing 3) Scallop dragging 4) Ghost fishing tangle nets 5) Ghost fishing lost traps 6) Finfish farms 7) Demersal Otter-trawl / longline fishery 8) Dredging and dumping in St-John harbour and other minor activities in other ports 9) Crab (Jonah) fishery 10) Rockweed harvesting <p>2) Illegal fishing is mainly due to self-consumption. It still occurs but is not as important as several years ago. There is a strong social control ("self-police") and illegal fishing is now socially unacceptable. At present, the impact is considered As minimal.</p> <p>Removals of lobster by means other than the commercial fishery are partially documented or undocumented, but are thought to be low relative to the commercial fishery.</p> <p>3) Small lobsters are known to settle on scallop's grounds, and the actual effect is not known. Dragging is prohibited in Lobster conservation zones, and the activity occurs mainly when lobster is not present on fishing grounds. Several changes took place since 1980 and the impact is now negligible. Dragging affects more the habitats, and it was said that a winter storm in the Bay of Fundy has more effect than dragging.</p> <p>4) Tangle/gill nets are used to target groundfish in general. The activity was considerably reduced, especially with the reduction on cod fishery, and the impact is now negligible.</p> <p>5) Due to the compulsory biodegradable twine, ghost fishing by lost traps is considered as nonexistent at present. Unattended traps could be a problem (some traps are reported to be left in water for the winter). However a 72h rule is in place: a trap must be retrieved during that time frame. The impact appears to be minor, or negligible.</p> <p>6) Finfish farming is a concern for lobster fishers. The potential impacts on habitat and caused by the releases of chemicals are not known. The risk is seen as potentially high however it should be localized.</p> <p>7) Very few activities of otter-trawl and longlines are taking place in lobster areas and the impact is negligible.</p> <p>8) Dredging and dumping in St-John harbour and other minor activities in other ports may be intense but very localized. Dumping areas are placed outside lobster fishing areas. The impact appears negligible.</p> <p>9) Bycatches may occur in the rock crab fishery. That fishery is not very active in the area and the impact is minimal.</p>
--	--

	<p>10) Rockweeds are known to be habitat for juvenile lobsters. The actual impact is uncertain. As harvesting is localized, the global impact on lobster stock is considered as minimal.</p> <p>As a consequence, the Assessment team together with stakeholders has identified the directed lobster trap fishing as the activity which poses the greatest risk to target species, and for scoring under SICA, the interaction between lobster trap fishing and the scoring element lobster (<i>Homarus americanus</i>) has been identified as the worst case scenario.</p>
Rationale for Spatial scale of activity	The fishery is widely distributed over lobster habitat, but fishers target concentrations of commercial animals. They avoid areas of berried females and juveniles. In Spring, less area is covered as the fishery takes place inshore. A wider area is covered during the fall season. The lobster is highly migratory in the area and can be caught anywhere. The estimated percentage of the area contacted by lobster traps was low (<0.1%). Taking attractive influence of traps (around 350 m ²), it is estimated that actual fishing grounds cover a much larger portion of the area. It was agreed that the actual fishing ground was between 30 and 40% of the geographical distribution, which leads to a score of 4.
Rationale for Temporal scale of activity	The fishing season is between 100 and 200 days, which give a score of 4.
Rationale for Intensity of activity	Effect of fishing is detectable. A decreasing of the lobster size and of the catch rates is observed over the season. The decreasing catch rate can also be attributed to temperature. Overall, the intensity is considered as moderate, corresponding to a score of 4.
Rationale for choosing most vulnerable sub-component	<p><u>Geographical distribution</u></p> <p>No detectable negative changes have been observed in the geographic distribution of lobster. The proportion of summer Research Vessel sets with lobsters, increasing from <20% in the mid-1990s to averaging over 80% in the last 10 years, indicates a wider distribution of lobsters at sufficient density to be caught routinely in the trawl survey. Therefore, the consequence of lobster fishery on the geographic range appears to be minor.</p> <p><u>Population size</u></p> <p>Current lobster landings are very high in the Bay of Fundy as a whole and in the individual LFAs. Landings in 2011-12 were more than 5 times the 50-year annual mean (1,628 t), were more than 2 times higher than 2005-06, and each of the last 5 years has been a new record high. Commercial catch per unit effort (CPUE in kg/trap haul) in the Bay of Fundy has increased in all LFAs since 2005-06. In the Bay of Fundy as a whole, the 2011-12 CPUE (1.9 kg per trap haul) was 1.8 times that of 2005-06. This increase in CPUE, coupled with increased fishing effort, explains the increase in landings in the Bay of Fundy since 2005-06.b The expansion of the geographical distribution can also be seen as an indicator of a healthy population size. The mean number of lobster per tow in the summer RV survey, considered as a primary indicator of lobster abundance, was consistently low from 1970 to the late 1990s and increased thereafter. Mean number per tow increased dramatically in the most recent years (2011 and 2012). This upward trend is corroborated by the ITQ survey.</p>

	<p>Overall, indicators of population size are positive and the effect of fishery on that component appears minor.</p> <p><u>Size/age/sex structure</u></p> <p>No changes in the sex structure are observed.</p> <p>Due to the longevity of the species, the consequence of fishing on individual size is not negligible. The fishing pressure induces a shrinkage of the size distribution. The largest size of female lobsters in the legal portion of the catch in commercial traps has trended downward in the last decade in some parts of the Bay of Fundy (LFA 36 and part of LFA 35).</p> <p>Size structure can be seen as one of the most vulnerable component.</p> <p><u>Reproductive capacity</u></p> <p>Reproductive capacity is perceived as the most vulnerable component, linked to the size structure. Size at onset of 50% maturity was estimated around 90-100 mm carapace length. As the minimum legal size is 82.5 mm, only a portion of females below the minimum legal size reaches maturity.</p>
Rationale for Consequence score	<p>The size of female lobsters shows different trends according to the fishing area. The mean female size, derived from at-sea sampling of the commercial catches, is more or less constant since 1990 around 95 mm CL in LFs 35 and 36, and 95-100 mm in LFA 38. However, a diminution of the largest females is most evident. The size structure in commercial traps in the Bay of Fundy showed some reductions in large sizes since the early 1990s. From at-sea sampling, of the two best sampled Grid Groups in LFA 36, one showed a decline in the 95th percentile of female size. Similarly, this measure declined in two of three Grid Groups in LFA 35. There was no such trend in LFA 38.</p> <p>Evidence indicates that the size at maturity has declined in the Bay of Fundy since the late 1970s. The size at onset of 50% maturity (SOM50) was estimated at 99.8 mm CL versus 108.3 mm CL in 1983. A study made in 2011 indicates that, in locations where mating success was high, SOM50 was around 91 mm CL.</p> <p>A model to estimate indices of the potential egg production was calculated. The total egg production potential (predicted from the maturity ogive) increased substantially in four representative locations when comparing the last 5-7 years to a historical time period in the 1980s. This trend is attributed to the smaller SOM. The observed egg production index, based on catch rates and fecundity-at-size of ovigerous females, did not increase to the same extent. This discrepancy between the observed egg production versus egg production potential was caused by a lower than expected contribution to egg production by small mature females.</p> <p>Despite those trends, the stock production appears to remain high.</p> <p>Landings in 2011-12 were more than 5 times the 50-year annual mean (1,628 t), were more than 2 times higher than 2005-06, and each of the last 5 years has been a new record high. Commercial catch per unit effort (CPUE in kg/trap haul) in the Bay of Fundy has increased in all LFAs since 2005-06. In the Bay of Fundy as a whole, the 2011-12 CPUE (1.9 kg per trap haul) was 1.8 times that of 2005-06.</p>

	<p>Commercial CPUE has increased in all LFAs since 2005-06. In the Bay of Fundy as a whole, the 2011-12 CPUE (1.9 kg /trap haul) was 1.8 times that of 2005-06.</p> <p>Even if the time series is short (starting in 2006), CPUEs of sublegal lobsters in the last two years, provided by the FSRS recruitment traps, program, were the highest in that time series.</p> <p>The summer RV and the ITQ survey number of lobsters per tow have both increased since 1996, from 6 lobster/tow to 14 in ITQ survey, and from less than 10 to more than 30 in the RV survey. The same trend was observed in the scallop survey, where comparison is possible. There has been an expansion of the area with lobster catches in the surveys, which suggests a widespread increase in abundance.</p> <p>It is therefore possible to detect change in reproductive capacity but the impact on population dynamics appears minimal, which leads to a consequence score of 2, equivalent to a MSC score of 80.</p>
--	---

**Table 1.2.1.c Scoring Template for PI 2.2.1 Bycatch Species
UoC 1**

Performance Indicator	Risk-causing activities from fishery under assessment	Spatial scale of activity	Temporal scale of activity	Intensity of activities	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE TWO: Bycatch Species Outcome	Fishing	2	3	3	Population size	1	100
Species:					Reproductive capacity		
Sculpin (<i>Myoxocephalus octodecemspinodus</i>)					Age/size/sex structure		
Rationale for selecting worst plausible case scenario					Geographic range		
	Under licence conditions, sculpin are allowed to be landed. However, in actual fishing practices, sculpin are returned immediately to the sea in a manner that causes the least harm. During the RBF meeting held in Moncton, sculpin have been identified as main bycatch species in the fishery by lobster fishermen.						

	<p>During the RBF meeting held in Moncton, the principal activities creating a risk to sculpin populations were identified as:</p> <ul style="list-style-type: none"> - Directed lobster trap fishery - Lobster traps loss (ghost fishing) - Bait - Scallop dredging - Rock crab trap fishing <p>Gear loss was considered to be negligible. Due to the cost of traps and the possible impact of gosh fishing on lobster and non-target species, initiatives are in place for lost trap recovery during the fishing season. Moreover, the requirement of modified biodegradable panels in 2013 fishing season will allow reducing the impact of ghost fishing. In addition, fishermen have mentioned during RBF meeting the use of a second rope on the traps line to prevent from traps moving on the bottom and traps lost.</p> <p>Regarding the use of bait in the fishery, under lobster licence conditions, sculpin is allowed to be landed for bait purposes but fishermen mentioned that sculpin is not used as bait. The main bait species are herring and mackerel. Gaspereau and silversides are secondary bait species. Therefore, bait collection is considered to have no detectable effect on sculpin.</p> <p>Bycatches of sculpin in other fisheries may exist. However, the fishermen have mentioned that they are lower than the ones in the lobster fishery.</p> <p>Therefore, the directed lobster trap fishing has been identified as the activity which poses the greatest risk to the main bycatch species, and for scoring under SICA, the interaction between lobster trap fishing and the scoring element sculpin has been identified as the worst case scenario.</p>
Rationale for Spatial scale of activity	<p>Sculpin belongs to the family of Cottidae and is distributed from eastern Newfoundland to Virginia. They are found shallow coastal waters like estuaries down to a depth of 192 m, and are very abundant in the SGSL.</p> <p>Sculpin enter in the trap attracting by bait. Fishing activity takes place over the lobster habitat. Traps are distributed on local spots. Fishers target concentrations of commercial lobsters. Considering the benthic footprint of traps (suggested to be less than 1%), stakeholders estimate that the spatial scale of activity is less than 15% of sculpin spatial distribution, giving a score of 2. The assessment team considers that the value of traps benthic footprint is underestimated. The benthic footprint does not take into account the area of attraction of the bait, which can be 380m². This would induce an actual prospected surface much larger than argued. However, the Assessment team was agree with stakeholders for a score of 2 rather than 3 which was giving for SICA for Target Species as the spatial distribution of sculpin is larger than the lobster one.</p> <p>Therefore, the assessment team estimates that a score of 2 is appropriate.</p>
Rationale for Temporal scale of	<p>The fishing season is thus 60 days per year for all LFAs, giving a temporal scale score of 3 (1-100 days per year).</p>

activity	
Rationale for Intensity of activity	The intensity of the activity is evaluated on the spatial and temporal scale of the activity, its nature and extent. The impact of the fishery sculpin is limited by the benthic footprint of lobster traps in relation with sculpin distribution and abundance and combined with the lobster fishery harvest strategy, which induces a decrease of bycatches. Therefore, an intensity score of 3 was considered appropriate.
Rationale for choosing most vulnerable sub-component	Sculpin is very abundant and widely distributed in the SGSL. Sculpin can reach a length of 46 cm but rarely growth larger than about 35 cm. In southern New England, sculpin spawning takes place from late November through January, and spawning times are speculated to be similar in the SGSL. Reported size of 50% maturity was 23 cm for females and 24 cm for males. According to fishermen, DFO, neither detectable change in the geographic distribution and size structure nor in reproductive capacity of sculpin have been detected. The population size was thus considered as the subcomponent the most likely affected by the lobster fishing activity.
Rationale for Consequence score	Sculpin is very abundant in the SGSL. During RBF and DFO meetings, the Assessment team has been told that no decrease in abundance has been observed and that there is no concern about this species. Considering the observation on the insignificant impact on abundance and the combination of only partial overlap between the fishery and sculpin populations and the management strategy implemented to reduce impacts on bycatch, it was considered to award a SICA consequence score of 1, with a MSC equivalent score of 100. Therefore, a PSA has not been undertaken.

Appendix 1.2.2 Productivity-Susceptibility Analysis (PSA)

Table 1.2.2.a PSA Principle 1 Rationale Table

UoC 1

PI 1.1.1 Stock Status		
Productivity	Rationale	Score
Average age at maturity.	50% mature at 7-8 years	2
Average maximum age	>25 years	3
Fecundity	Varies from 5000 to 66000 according to size	2
Average maximum size	May reach a maximum carapace length of 200 mm but average maximum size is <100 mm	1
Average size at maturity	50% mature at carapace length around 72 mm	1
Reproductive strategy	Eggs incubated by the female under the tail until hatching into the water column. Reproductive strategy could be compared to demersal oviparity.	2
Trophic level	Generalist feeder – predator of invertebrates and dead animals. Trophic level =3.2	2
Fishery		
Susceptibility	Rationale	Score
Areal Overlap	Spatial scale activity was determined to be between 15-30%, and the species is not impacted by other fisheries.	2
Vertical Overlap	There is a high overlap between lobster and traps as lobster is a benthic species and traps are set on the seafloor.	3
Selectivity	Species regularly found in the trap but traps are highly selective on a fraction, harvestable, population. Smaller individual are not selected, due to escape vent; the diameter of the entrance ring may prevent largest	2

	individuals to enter the traps. Important amount of berried female caught. Therefore, the selectivity induces a medium risk.	
Post capture mortality	<p>Retained species. Important amount of berried female caught (berried females catch represents approximately 20% of the lobster total catch) but good handling and release practices in place and evidence that they are released alive.</p> <p>CC2.4.2.2.5 a.i.) There are no biological factors that limit the potential of the species, like most of the exploited crustacean species, to be captured alive. In fact biological factors support high survivorship. NB and NS lobster are captured and sold alive; a.ii) Lobster Handling Workshops are organized for fishermen, handling and release practices are designed to allow a high post-release survival and to minimize eggs loss. The stock productivity indicators are high. C&P staff and DFARD staff field observations confirm that harvesters practices are in high compliance with good handling practices; a.iii) Current fishing practices in place are designed to immediately return discards to the sea as soon as the catch is on the desk; all berried females must be immediately released as required by fishing regulations; a.iv) Due to the handling and release practices, berried females are released in condition permitting a subsequent survival.</p> <p>CC2.4.2.2.5 b. states "<i>observer data or other verified field observations made during the commercial fishing operation that indicate</i>". During the site visit, the Assessment team met the C&P staff, DFO scientists, and DFARD staff and confirmation was provided that berried female are cautiously released alive and survivorship is high.</p> <p>CC2.4.2.2.6a.b. During the site visit, the Assessment team met the C&P staff and at-sea enforcement activities confirmed that 100% of berried female are cautiously released alive and survivorship is high. C&P staff has reported a significant high level of compliance by lobster harvesters with fishing regulations.</p>	2

UoC 2

PI 1.1.1 Stock Status	American lobster (<i>Homarus americanus</i>)	
Productivity	Rationale	Score
Average age at maturity.	50% mature at 8-10 years	2
Average maximum age	>25 years	3
Fecundity	Varies from 5000 to 66000 according to size	2
Average maximum size	May reach a maximum carapace length of 200 mm but average maximum size is <100 mm	1
Average size at maturity	50% mature at carapace length around 75 mm (LFAs 27-30), 85 mm (LFA 31a-b), 90 mm (LFA 33).	1
Reproductive strategy	Eggs incubated by the female under the tail until hatching into the water column. Reproductive strategy could be compared to demersal oviparity.	2
Trophic level	Generalist feeder – predator of invertebrates and dead animals. Trophic level =3.2	2
Fishery		
Susceptibility	Rationale	Score
Areal Overlap	Spatial scale activity was determined to be between 15-30%, and the species is not impacted by other fisheries.	2
Vertical Overlap	There is a high overlap between lobster and traps as lobster is a benthic species and traps are set on the seafloor.	3
Selectivity	Species regularly found in the trap but traps are highly selective on a fraction, harvestable, population. Smaller individual are not selected, due to escape vent; the diameter of the entrance ring may prevent largest individuals to enter the traps. Important amount of berried female caught. Therefore, the selectivity induces a medium risk.	2
Post capture mortality	Retained species. Important amount of berried female caught (berried females catch represents approximately 20% of the lobster total catch) but good handling and release practices in place and evidence that they are	2

	<p>released alive.</p> <p>CC2.4.2.2.5 a.i.) There are no biological factors that limit the potential of the species, like most of the exploited crustacean species, to be captured alive. In fact biological factors support high survivorship. NB and NS lobster are captured and sold alive; a.ii) Lobster Handling Workshops are organized for fishermen, handling and release practices are designed to allow a high post-release survival and to minimize eggs loss. The stock productivity indicators are high. C&P staff field observations confirm that harvesters practices are in high compliance with good handling practices; a.iii) Current fishing practices in place are designed to immediately return discards to the sea as soon as the catch is on the desk; all berried females must be immediately released as required by fishing regulations; a.iv) Due to the handling and release practices, berried females are released in condition permitting a subsequent survival.</p> <p>CC2.4.2.2.5 b. states "<i>observer data or other verified field observations made during the commercial fishing operation that indicate</i>". During the site visit, the Assessment team met the C&P staff, DFO scientists, and DFARD staff and confirmation was provided that berried female are cautiously released alive and survivorship is high.</p> <p>CC2.4.2.2.6a.b. During the site visit, the Assessment team met the C&P staff and at-sea enforcement activities confirmed that 100% of berried female are cautiously released alive and survivorship is high. C&P staff has reported a significant high level of compliance by lobster harvesters with fishing regulations.</p>	
--	--	--

UoC 3

PI 1.1.1 Stock Status	American lobster (<i>Homarus americanus</i>)	
Productivity	Rationale	Score
Average age at maturity.	50% mature at 8-10 years	2
Average maximum age	>25 years	3
Fecundity	Varies from 5000 to 66000 according to size	2
Average maximum size	May reach a maximum carapace length of 200 mm but average maximum size is around 140 mm.	1
Average size at maturity	50% mature at carapace length around 96.5 mm.	1
Reproductive strategy	Eggs incubated by the female under the tail until hatching into the water column. Reproductive strategy could be compared to demersal oviparity.	2
Trophic level	Generalist feeder – predator of invertebrates and dead animals. Trophic level =3.2	2
Fishery		
Susceptibility	Rationale	Score
Areal Overlap	Spatial scale activity was determined to be between 15-30%, and the species is not impacted by other fisheries.	2
Vertical Overlap	There is a high overlap between lobster and traps as lobster is a benthic species and traps are set on the seafloor.	3
Selectivity	Species regularly found in the trap but traps are highly selective on a fraction, harvestable, population. Smaller individual are not selected, due to escape vent; the diameter of the entrance ring may prevent largest individuals to enter the traps. Important amount of berried female caught. Therefore, the selectivity induces a medium risk.	2
Post capture mortality	Retained species. Important amount of berried female caught (berried females catch represents approximately 20% of the lobster total catch) but good handling and release practices in place and evidence that they are	2

	<p>released alive.</p> <p>CC2.4.2.2.5 a.i.) There are no biological factors that limit the potential of the species, like most of the exploited crustacean species, to be captured alive. In fact biological factors support high survivorship. NB and NS are captured and sold alive; a.ii) Lobster Handling Workshops are organized for fishermen, handling and release practices are designed to allow a high post-release survival and to minimize eggs loss. The stock productivity indicators are high. C&P staff field observations confirm that harvesters practices are in high compliance with good handling practices; a.iii) Current fishing practices in place are designed to immediately return discards to the sea as soon as the catch is on the desk; all berried females must be immediately released as required by fishing regulations; a.iv) Due to the handling and release practices, berried females are released in condition permitting a subsequent survival.</p> <p>CC2.4.2.2.5 b. states "<i>observer data or other verified field observations made during the commercial fishing operation that indicate</i>". During the site visit, the Assessment team met the C&P staff, and DFO scientists and confirmation was provided that berried female are cautiously released alive and survivorship is high.</p> <p>CC2.4.2.2.6a.b. During the site visit, the Assessment team met the C&P staff and at-sea enforcement activities confirmed that 100% of berried female are cautiously released alive and survivorship is high. C&P staff has reported a significant high level of compliance by lobster harvesters with fishing regulations.</p>	
--	---	--

UoC 4

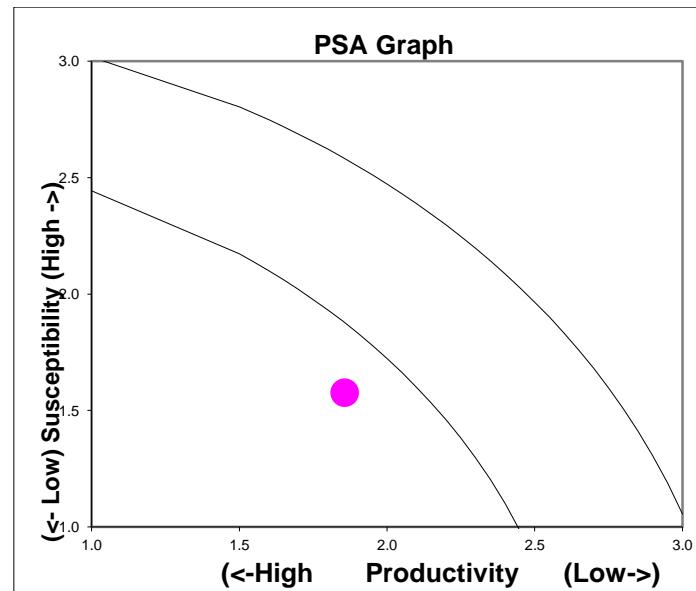
PI 1.1.1 Stock Status	American lobster (<i>Homarus americanus</i>)	
Productivity	Rationale	Score
Average age at maturity.	50% mature at 8-10 years	2
Average maximum age	>25 years	3
Fecundity	Varies from 5000 to 66000 according to size	2
Average maximum size	May reach a maximum carapace length of 200 mm but average maximum size is around 140 mm.	1
Average size at maturity	50% mature at carapace length around 96.5 mm.	1
Reproductive strategy	Eggs incubated by the female under the tail until hatching into the water column. Reproductive strategy could be compared to demersal oviparity.	2
Trophic level	Generalist feeder – predator of invertebrates and dead animals. Trophic level =3.2	2
Fishery		
Susceptibility	Rationale	Score
Areal Overlap	Spatial scale activity was determined to be between 15-30%, and the species is not impacted by other fisheries.	2
Vertical Overlap	There is a high overlap between lobster and traps as lobster is a benthic species and traps are set on the seafloor.	3
Selectivity	Species regularly found in the trap but traps are highly selective on a fraction, harvestable, population. Smaller individual are not selected, due to escape vent; the diameter of the entrance ring may prevent largest individuals to enter the traps. Important amount of berried female caught. Therefore, the selectivity induces a medium risk.	2
Post capture mortality	Retained species. Important amount of berried female caught (berried females catch represents approximately 20% of the lobster total catch) but good handling and release practices in place and evidence that they are	2

	<p>released alive.</p> <p>CC2.4.2.2.5 a.i.) There are no biological factors that limit the potential of the species, like most of the exploited crustacean species, to be captured alive. In fact biological factors support high survivorship. NB and NS lobsters are captured and sold alive; a.ii Lobster Handling Workshops are organized for fishermen, handling and release practices are designed to allow a high post-release survival and to minimize eggs loss. The stock productivity indicators are high. C&P staff field observations confirm that harvesters practices are in high compliance with good handling practices; a.iii) Current fishing practices in place are designed to immediately return discards to the sea as soon as the catch is on the desk; all berried females must be immediately released as required by fishing regulations; a.iv) Due to the handling and release practices, berried females are released in condition permitting a subsequent survival.</p> <p>CC2.4.2.2.5 b. states "<i>observer data or other verified field observations made during the commercial fishing operation that indicate</i>". During the site visit, the Assessment team met the C&P staff, and DFO scientists and confirmation was provided that berried female are cautiously released alive and survivorship is high.</p> <p>CC2.4.2.2.6a.b. During the site visit, the Assessment team met the C&P staff and at-sea enforcement activities confirmed that 100% of berried female are cautiously released alive and survivorship is high. C&P staff has reported a significant high level of compliance by lobster harvesters with fishing regulations.</p>	
--	---	--

MSC PSA Worksheet for RBF v1.1

For all UoCs (Catches in the Table are 9,928 t for UoC 1; are 9,811 t for UoC 2; are 23,292 t for UoC 3; and for are 8,467 t for UoC 4)

PI	TAXA_NAME	FAMILY_NAME	SCIENTIFIC_NAME	COMMON_NAME	GEAR_TYPE (1.1.1)	Productivity Scores [1-3]						Susceptibility Scores [1-3]				1.1.1 only			PSA scores (automatic)							
						Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level (fishbase)	Total Productivity (average)	Availability	Vertical overlap	Selectivity	Post-capture mortality	Total (multiplicative)	Catch (tons) (1.1.1)	Weighting (1.1.1)	Weighted Total	Weighted average	Color on PSA plot	PSA Score	MS C Score	Risk Category Name
1. 1. 1.	Crustacean	Nephropidae	<i>Homarus americanus</i>	American lobster	Baited Trap	2	3	2	1	1	2	2	1.86	2	3	2	2	1.58	9.928	1.00	1.58	1.58	2.44	85.9	Low	>80



Determination of final score for PI 1.1.1

Table CC19: Rules for use of SICA or PSA scores

SICA	PSA	Rule
>80	>80	Higher score of the two, continue RBF use
>80	60 to 80	Use PSA, only allowed to use RBF once
>80	<60	Fail
60 to 80	>80	Use PSA, only allowed to use RBF once
60 to 80	60 to 80	Use PSA, only allowed to use RBF once
60 to 80	<60	Fail
<60	>80	Use PSA, only allowed to use RBF once
<60	60 to 80	Use PSA, only allowed to use RBF once
<60	<60	Fail

For UoC 1

SICA and PSA scores are 90 and 85.9, respectively. Therefore both scores are higher than 80. According to the Rules for use SICA and PSA scores detailed in Table CC19, the final score for PI 1.1.1 is **90**.

For UoCs 2, 3 and 4

SICA and PSA scores are 80 and 85.9, respectively. Therefore both scores are higher than 80. According to the Rules for use SICA and PSA scores detailed in Table CC19, the final score for PI 1.1.1 is **85.9**.

Appendix 1.3 Conditions and Client Action Plan

Following are the stated conditions as provided in the Draft Client Report dated July 1, 2014. There were also additions, modifications and elimination of conditions subsequent to the draft report, as follows:

- One condition (bycatch) required in accordance with notification from SAI Global on July 11, 2014.
- Two conditions (mackerel bait) required in accordance with notification from SAI Global on July 31, 2014.
- Elimination of one condition (IFMP adoption) in accordance with notification by SAI Global on September 1, 2014.

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.

A draft Client Action Plan was submitted to the client group, DFO and NS/NB Client Group by Pisces on July 4, 2014. Subsequent consultations with the client group and DFO has resulted in this ratified Final Client Action Plan to SAI Global on October 20, 2014.

There are five conditions for all units of certification 1 through 4 relating to performance indicators 1.2.2, 2.1.1, 2.1.2, 2.2.3 and 3.2.4 that are addressed in this Action Plan.

Table A1.3: Condition 1 (For all UoCs)

Performance Indicator	PI 1.2.2 Harvest Control rules
Score	65
Rationale	<p>UoC 1</p> <p>General understood harvest rules are in place: increase of minimum legal size, mandatory release of berried females and females in the window size, escape vent, prohibition of fishing on Sundays. Those rules are consistent with the harvest strategy. Fishing pressure has also declined, due to the reduction of nominal fishing effort. Those rules are not well defined in relation with a harvest strategy.</p> <p>New reference points were accepted in 2014, based on landings. Those points define the upper reference point (above which the stock can be considered as healthy) and a lower reference point (below which the stock is endangered). At present no well-defined harvest control rules exist to adjust those management measures when reference points are approached.</p> <p>UoC 2, 3 and 4</p> <p>General understood harvest rules are in place: fixed number of licenses, a maximum number of traps per license, minimum legal size, mandatory release of v-notched and berried females, escape vent. The landings are at the highest in the history, as well as standardized CPUEs, both for legal and sublegal lobsters. Those rules are consistent with the harvest strategy which aims at maintaining the productivity of the stock.</p> <p>Reference points were accepted in 2012, based on landings. Those points define the upper reference point (above which the stock can be considered as healthy) and a lower reference point (below which the stock is endangered).</p> <p>In the concept of the precautionary approach, other reference points were proposed,</p>

	<p>based on CPUEs and trawl surveys.</p> <p>The IFPM clearly states: "If landing levels reach 80% of the median landing levels the upper stock reference point will be reached and measures will be taken to reduce the removal rate". Even if generic actions, as potential responses to decreasing stock abundance, are suggested in the IFMP, they are not still officially implemented to define clear actions when reference points are approached.</p>
Condition	The client must provide evidence of implementation of well-defined harvest control rules, taking into account main uncertainties, that reduce exploitation rates as the limit reference point is approached.
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that consultation between relevant stakeholders about the harvest control rules have been scheduled (score remains unchanged).</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that consultation between relevant stakeholders occurred to discuss about the harvest control rules (score remains unchanged).</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that harvest control rules have been defined and approved (score remains unchanged).</p> <p><u>By Year 4:</u> The Assessment team shall be provided with documentary evidence that harvest control rules have been implemented (score reaches 80).</p>
Client action plan	<p><u>Action Plan</u></p> <ol style="list-style-type: none"> 1. The client shall immediately engage DFO to discuss options and next steps to enable the client to fulfil this condition. 2. The client shall support the acquiring of any additional information that may be required to support these activities. 3. The client will provide documentary evidence of the requests and support provided on this condition. 4. The client will provide all necessary support to DFO to ensure that all required milestones as prescribed are met. <p><u>Responsible parties</u></p> <ol style="list-style-type: none"> 1. The client will promote the HCR process with all lobster fishery stakeholders/participants. 2. The client, with support from DFO through established consultative processes, will conduct consultations with relevant stakeholders groups. 3. The client and lobster fishery stakeholders/participants will support activities of DFO in developing and implementing Harvest Control Rules (HCR's) in relation to the Precautionary Approach for all Lobster Fishing Areas (LFAs). 4. The client will ensure that the HCR's are consistent with MSC principle 1. 5. DFO will make publicly available the final HCR's. <p><u>Timeframe for Milestones</u></p> <ol style="list-style-type: none"> 1. By the first annual surveillance audit the CAB shall be presented with evidence that consultations with relevant committees or groups regarding HCR's have been scheduled. 2. By the second annual surveillance audit the CAB will be presented with evidence that consultations have occurred. 3. By the third surveillance audit the CAB will be presented with evidence that the HCR's have been defined and approved. 4. By the fourth surveillance audit the CAB will be presented with evidence that the HCR's have been implemented.
Consultation on condition	DFO

Table B1.3: Condition 2 (For all UoCs)

Performance Indicator	PI 2.1.1 Retained Species Outcome
Score	70
Rationale	<p>As a result of the last stock assessment, it is likely that the Canadian mackerel stock is currently overfished and in a situation of recruitment overfishing.</p> <p>The impact of the lobster fisheries on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the number of traps induced less bait used.</p> <p>UoC 1</p> <p>The nominal NB and NS lobster fishing effort was reduced over the years. The total NB and NS fishing licenses went from 1,954 in 2006 to 1,720 in 2012. Also, the number of traps per license was reduced in areas 26A1 (from 300 to 280), 26A2 (from 300 to 275), 26A3 (from 300 to 250), and 26B North and South (from 300 to 250).</p> <p>UoCs 2, 3 and 4</p> <p>The nominal NB and NS lobster fishing effort was reduced over the years. A lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery. The number of traps per licence has been reduced from 275 to 250 in LFAs 27-33.</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy of demonstrably effective management measures in place in the lobster fisheries to ensure that the fisheries do not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fisheries from meeting 80c.</p>
Condition	The client must provide evidence that a partial strategy of demonstrably effective management measures is in place such that the NB and NS lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock.
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been discussed.</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been proposed and agreed.</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been implemented.</p> <p><u>By Year 4:</u> The Assessment team shall be provided with documentary evidence that the implemented partial strategy will work.</p>

	<p>Action Plan</p> <ol style="list-style-type: none"> 1. The client group shall immediately meet to discuss options to fulfil this condition. 2. The client will ensure industry defines method(s) to reduce mackerel bait use. Further, the client will work to define methods to collect adequate proxy information to benchmark and monitor mackerel bait use. 3. The client shall support the acquisition of any additional information that may be required to support these activities. 4. The client will provide documentary evidence of the requests and support provided on this condition. 5. The client will report on mackerel bait use as required to meet this condition. <p>Responsible parties</p> <ol style="list-style-type: none"> 1. The client, with the support of other participating parties and in consultation with harvesting representatives, will define how to reduce mackerel bait use and the method for ongoing data collection and reporting of mackerel bait use. 2. The client will develop the program. 3. The client will implement the program with participation of all affected stakeholders. 4. The client and will analyze and make publicly available the mackerel bait use results. <p>Timeframe for Milestones</p> <ol style="list-style-type: none"> 1. By the first annual surveillance audit the CAB shall be presented with evidence that a partial strategy has been discussed. 2. By the second surveillance audit the CAB shall be provided with documentary evidence that a partial strategy to reduce the use of Canadian mackerel as bait has been proposed and agreed. 3. By the third surveillance audit the CAB shall be provided with documentary evidence that a partial strategy to reduce the use of Canadian mackerel as bait has been implemented. 4. By the fourth surveillance audit the CAB shall be provided with documentary evidence that the amount of Canadian mackerel used as bait has been significantly reduced.
Consultation on condition	Lobster Industry

Table C1.3: Condition 3 (For all UoCs)

Performance Indicator	PI 2.1.2 Retained Species Management Strategy
Score	70
Rationale	<p>UoC 1</p> <p>There is some objective basis for confidence that strategies will work, based on evidence from stock assessment results for rock crab and fall-spawning herring and US mackerel used as bait, and from fisheries characteristics and management, and the biological characteristics for secondary bait species. So the fishery meets 60b and 80b for these species.</p> <p>There is some evidence that strategies is being implemented successfully, based on evidence from stock assessment results for rock crab and fall-spawning herring and US mackerel used as bait, and from fisheries characteristics and management, and the biological characteristics for secondary bait species. So the fishery meets 80c for these species.</p>

	<p>The impact of the lobster fisheries on the Canadian mackerel stock is indirect. Canadian mackerel uses as bait is purchased by lobster fishermen to local directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in the Canadian mackerel stock assessment.</p> <p>There are measures or fishing practices in place that are expected to ensure that the lobster fishery does not hinder recovery and rebuilding of the mackerel stock.</p> <p>According to the GCB3.3 “Measures” are individuals actions or tools that may be in place either explicitly to manage impacts on the component or incidentally, being designed primarily to manage impacts on another component, indirectly contribute to management of the component under assessment.</p> <p>The reduction of the number of licences and the reduction of the number of traps per licence over the years are management measures that have contributed to reduce the impact on the Canadian mackerel and other P2 components as a decrease in the</p>
--	--

	<p>number of traps induced less bait used. The nominal NB and NS lobster fishing effort was reduced over the years. A lobster licence buy-back program was implemented to reduce the number of participants, and in particular those who were not dependent on the fishery. The number of traps per licence has been reduced from 275 to 250 in LFAs 27-33.</p> <p>In addition, the high price of bait species is a wide concern in all Atlantic Canada lobster fisheries and has forced lobster harvesters to a better and optimal utilization of bait.</p> <p>However, the assessment team considered that there is no formal partial strategy of demonstrably effective management measures in place in the lobster fisheries to ensure that the fisheries do not hinder recovery and rebuilding of the Canadian mackerel stock, preventing the fishery from meeting.</p>
Condition	The client must provide evidence that a partial strategy is in place to ensure the NB and NS lobster fisheries do not hinder the recovery and rebuilding of the Canadian mackerel stock. Also, the client must provide some evidence that the partial strategy is being implemented successfully.
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been discussed (score remains unchanged).</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been proposed and agreed (score remains unchanged).</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that a partial strategy to ensure the fishery does not hinder the recovery and rebuilding of the Canadian mackerel has been implemented (score reaches 75).</p> <p><u>By Year 4:</u> The Assessment team shall be provided with documentary evidence that the implemented partial strategy will work (score reaches 80).</p>
Client action plan	<p><u>Action Plan</u></p> <ol style="list-style-type: none"> 6. The client group shall immediately meet to discuss options to fulfil this condition. 7. The client will ensure industry defines method(s) to reduce mackerel bait use. Further, the client will work to define methods to collect adequate proxy information to benchmark and monitor mackerel bait use. 8. The client shall support the acquisition of any additional information that may be required to support these activities. 9. The client will provide documentary evidence of the requests and support provided on this condition. 10. The client will report on mackerel bait use as required to meet this condition. <p><u>Responsible parties</u></p> <ol style="list-style-type: none"> 5. The client, with the support of other participating parties and in consultation with harvesting representatives, will define how to reduce mackerel bait use and the method for ongoing data collection and reporting of mackerel bait use. 6. The client will develop the program. 7. The client will implement the program with participation of all affected stakeholders. 8. The client and will analyze and make publicly available the mackerel bait use results. <p><u>Timeframe for Milestones</u></p> <ol style="list-style-type: none"> 5. By the first annual surveillance audit the CAB shall be presented with evidence that a partial strategy has been discussed. 6. By the second surveillance audit the CAB shall be provided with documentary evidence that a partial strategy to reduce the use of Canadian mackerel as bait

	<p>has been proposed and agreed.</p> <p>7. By the third surveillance audit the CAB shall be provided with documentary evidence that a partial strategy to reduce the use of Canadian mackerel as bait has been implemented.</p> <p>8. By the fourth surveillance audit the CAB shall be provided with documentary evidence that the amount of Canadian mackerel used as bait has been significantly reduced.</p>
Consultation on condition	Lobster Industry

Table D1.3: Condition 4 (For all UoCs)

Performance Indicator	PI 2.2.3 Bycatch Species Information
Score	70 (UoC 1); 75 (UoCs 2, 3, and 4)
Rationale	<p>UoC 1 Sculpin have been identified as main bycatch species by stakeholders during the RBF meeting. An estimation of the amount of sculpin caught in lobster traps is 3-4 individuals per day for the entire number of traps of one fisherman. Thus qualitative and some quantitative information are available on the amount of main bycatch species in the fishery, but accurate and verifiable information is not on the amount of all bycatch species and the consequences for the status of affected population. Due to the absence of bycatch data collection in the fishery, sufficient data are not collected to detect any increase in risk and to assess mortalities to bycatch species.</p> <p>UoC 2, 3 and 4 Based on the available documentation and information provided by DFO and lobster fishermen during site visit meetings, the Assessment team concluded that there is no main bycatch species and considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is negligible. Due to the absence of bycatch data collection in most of the LFAs, sufficient data are not collected to detect any increase in risk and to assess mortalities to potential main bycatch species.</p>
Condition	<p>UoC 1 The client must provide evidence that information on bycatch is adequate to support a partial strategy to manage main bycatch species, and that accurate and sufficient data on the amount of main bycatch species affected by the fisheries are collected to detect any increase in risk to main bycatch species.</p> <p>UoC 2, 3 and 4 The client must provide evidence that accurate and sufficient data on the amount of main bycatch species affected by the fisheries are collected to detect any increase in risk to main bycatch species.</p>
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that a system for bycatch data collection has been designed (score remains unchanged).</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that a system for bycatch data collection has been agreed and tested (score remains unchanged).</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that a system for bycatch data collection has been implemented within the fishery management system (score remains unchanged).</p> <p><u>By Year 4:</u> The Assessment team shall be provided with documentary evidence that there is an on-going system for bycatch data collection (score reaches 80).</p>
Client action plan	<p>Action Plan</p> <ol style="list-style-type: none"> 1. The client shall immediately request to meet with DFO to discuss the options available to fulfil this condition.

	<p>2. The client will acquire any additional information that may be required to support these activities.</p> <p>3. The client will provide documentary evidence of the requests and support provided on this condition.</p> <p>4. The client will consult with the DFO and other participating parties to define methods to collect adequate proxy information to reflect bycatch encounters in all LFA's.</p> <p>5. The client will test bycatch data collection methods.</p> <p>6. The client will ensure that information will be processed and reported regarding by catch data as required to meet the condition.</p>
	<p>Responsible parties</p> <ol style="list-style-type: none"> 1. The client, with the support of DFO and other participating parties, will develop and implement a bycatch data collection, reporting and monitoring program. 2. The client will consult with DFO and/or harvesting representatives, will define the best methods for ongoing data collection for bycatch. 3. The client will support or provide resources to ensure bycatch data collection is completed. 4. The client, with support from DFO and other participating parties, will implement the program with participation by harvesting stakeholders. 5. The client will analyze bycatch results and DFO will provide review as appropriate. 6. The client will make the bycatch results publicly available. <p>Timeframe for Milestones</p> <ol style="list-style-type: none"> 1. By the first annual surveillance audit the CAB shall be presented with evidence that there have been consultations regarding how data for the bycatch system will be collected, and that a system for bycatch data collection has been designed. 2. By the second surveillance audit the CAB shall be provided with documentary evidence that a system for bycatch data collection has been ratified and testing has been conducted. 3. By the third surveillance audit the CAB shall be provided with documentary evidence that a system for bycatch data collection has been implemented within the fishery management system. 4. By the fourth surveillance audit the CAB shall be provided with documentary evidence that there is an on-going system for bycatch data collection, analysis and reporting.
Consultation on condition	DFO

Table E1.3: Condition 5 (for all UoCs)

Performance Indicator	PI 3.2.4 Research Plan
Score	70
Rationale	<p>The Assessment Team noted that a comprehensive suite of research activities is conducted for the fishery, habitat and ecosystem by DFO and associated partners from other government agencies, academia, industry and NGOs. Many of these activities would appear to be well planned and executed, and results serve to achieve various objectives and management needs.</p> <p>However, the Assessment Team found no documented evidence to indicate that a formalized regional research plan was developed to provide the management system</p>

	with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. By extension, there was no documented evidence of a comprehensive research plan that 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.
Condition	The client must provide evidence that a written research plan for the fishery 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.
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence that stakeholder consultations regarding the research plan for the SGSL lobster fishery have been commenced or are planned.</p> <p><u>By Year 2:</u> The Assessment team shall be provided with documentary evidence that a research plan reflective of existing and scheduled research activities has been developed, and that their activities, milestones, and results (proposed or achieved) support the objectives and requirements of Principles 1 and 2. The plan shall incorporate research activities conducted by other organizations in so far as they relate to Principles 1 and 2.</p> <p><u>By Year 3:</u> The Assessment team shall be provided with documentary evidence that the research plan has been agreed and implemented for the fishery, and is updated annually (as required) for the remainder of the certification period.</p>
Client action plan	<p><u>Action Plan</u></p> <ol style="list-style-type: none"> 1. The client shall immediately engage DFO and the other participating parties on what information and support can be provided to fulfill this condition. 2. The client will acquire any additional information that may be required to support these activities. 3. The client will provide documentary evidence of the requests and support provided on this condition. 4. The client will consult with DFO and representative stakeholders on the research plan, e.g., through advisory committee meetings. 5. As a result of the consultations, the client will develop the research plan specific to the region's lobster fishery in accordance with MSC principles 1 and 2. 6. The client, DFO and other stakeholders will develop monitoring and measurement activities with respect to the research plan within the area of their respective responsibility. <p><u>Responsible parties</u></p> <ol style="list-style-type: none"> 1. The client will develop and implement a consultative approach for the research plan. 2. The client will produce the research plan. 3. DFO will make its Inshore Lobster research plan available for discussion at various forums, e.g. annual advisory committee meetings, for future inclusion in the client's overall research plan for this fishery. 4. The client will ensure the research plan supports the objectives of MSC Principles 1 and 2. <p><u>Timeframe for Milestones</u></p> <ol style="list-style-type: none"> 1. By the first annual surveillance audit the CAB shall be presented with evidence that consultations are planned or there have been consultations regarding how to implement the research plan. 2. By the second annual surveillance audit the CAB shall be presented with evidence that a research plan, including that research conducted by other organizations, reflecting existing and scheduled research activities has been developed, and that these activities, milestones, and results support the

	<p>objectives and requirements of Principles 1 and 2.</p> <p>3. By the third surveillance audit the CAB shall be provided with documentary evidence that the research plan has been agreed and implemented for the fishery, and is updated annually (as required) for the remainder of the certification period.</p>
Consultation on condition	DFO

Evidence of DFO Gulf and Maritimes support to the Client Action Plan



Fisheries and Oceans

Gulf Region
P.O. Box 5030
Moncton, New Brunswick
E1C 9B6

NOV - 3 2014

Nova Scotia and New Brunswick Lobster Eco-Certification Society
1819 Granville Street
Unit 302
Halifax, Nova Scotia
B3H 1A1

Nova Scotia and New Brunswick Lobster Eco-Certification Society

[Re: Fisheries and Oceans Canada Support for Marine Stewardship Council Action Plan](#)

This letter is to advise you that Fisheries and Oceans Canada (DFO) Gulf Region agrees to support the Action Plan you have drafted for the Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster fisheries, with the caveat that DFO's contributions will be limited to actions that align with DFO's annual workplan activities.

DFO will continue to support your effort to successfully meet the conditions of certification. To that effect, discussions are underway to address items of the Action Plan.

I would like to take this opportunity to applaud the Nova Scotia and New Brunswick Lobster Eco-Certification Society for its ongoing commitment to a sustainable fishery and I wish you all the best in your effort to be granted with Marine Stewardship Council certification.

Yours sincerely,

[Signature]

Morley Knight
Regional Director General



Fisheries and Oceans Canada Pêches et Océans Canada

1 Challenger Drive
P.O. Box 1006
Dartmouth, NS
B2Y 4A2

NOV 03 2014

Nova Scotia and New Brunswick Lobster Eco-Certification Society

Attention: Mr. Peter Norsworthy
1819 Granville Street
Unit 302
Halifax NS B3H 1A1

Re: Fisheries and Oceans Canada's (DFO) Support for the Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster (*Homarus americanus*) trap fishery Client Action Plan

Dear Mr. Norsworthy:

Thank you for sharing the Client Action Plan you have drafted for the Marine Stewardship Council (MSC) Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster (*Homarus americanus*) trap fishery. With the recognition that this plan represents your commitment, as the client, to accept responsibility for meeting the stated conditions, and with the caveat that DFO's contributions will be limited to actions that align with DFO's annual work plan activities, DFO supports the plan.

We expect that, in the coming months, a more detailed work plan will define timelines and accountabilities that touch on areas of DFO authority. Please note that this work plan will be reviewed on an annual basis to assess its alignment to DFO's annual plans and priorities. As a result, additional internal review will be required in advance of DFO commencing activities to support the Client Action Plan.

I would like to take this opportunity to applaud the Nova Scotia and New Brunswick Lobster Eco-Certification Society for their on-going commitment to a sustainable fishery and we wish you all the best in your effort to become Marine Stewardship Council certified.

Yours sincerely,

Faith G. Scattolon
Regional Director-General
Maritimes Region

Appendix 2. Peer Review Reports

Peer Review Report A

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>The team's conclusion that the fishery is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing is sound. However, rationales in RBF tables for PI 1.1.1 are superficial and qualitative. Detailed comments here in the peer review template as well as highlighted in the tables provide context and perspective that should be considered.</p>	Yes	The assessment team acknowledges the reviewer for his comment. The response to the comment on rationales in RBF tables for PI 1.1.1 is provided the table for RBF.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes/No	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>Condition 1 – 1.2.2 – clearly stated for all UoCs. Condition 2 – 2.1.1 – clearly stated for all UoCs. Condition 3 – 2.1.2 – clearly stated for all UoCs. Condition 4 – 2.2.3 – clearly stated for all UoCs. Condition 5 – 3.2.4 – clearly stated for all UoCs.</p>	Yes	No response required.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes/No	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>Condition 1 – 1.2.2 – all UoCs should be able to close this condition as per the client action plan. Condition 2 – 2.1.1 – all UoCs should be able to close this condition as per the client action plan. Condition 3 – 2.1.2 – all UoCs should be able to close this condition as per the client action plan. Condition 4 – 2.2.3 – all UoCs should be able to close this condition as per the client action plan. Condition 5 – 3.2.4 – all UoCs should be able to close this condition as per the client action plan.</p>	Yes	No response required.

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

General Comments on the Assessment Report (optional)

This assessment covers 4 Units of Certification, each with several management units (LFAs) and varying degrees of rollup for different PIs. Principle 1 background sections were especially unwieldy to review. I read P1 background for UoC 1 and provided detailed comments in balloons highlighted in the text – these are an integral part of the review. The following points should be considered for each UoC.

Assessment team's response: the text was modified according to the inserted comments.

- 1) During FRCC (1995) deliberations, available evidence (the very first E/R analyses for various populations) indicated that E/R was only around 1% that of an unfished population. In the US, 10% had been adopted as the recruitment overfishing threshold. The FRCC recommendation to increase E/R to 5% (i.e. a 5-fold increase) was too much for industry/DFO management to deal with. The E/R doubling objective (increase from 1% to 2%) was a cop out. Achieving the doubling objective (i.e. a 100% increase) is being portrayed in this assessment as far more than what it actually was. If there are no newer/better E/R analyses available, even the original ones would provide a reasonable basis for determining the extent to which E/R has been increased overall. This background would provide some realistic context/perspective regarding lobster fishery management in Atlantic Canada over the past 15-20 years.

Assessment team's response: the text was modified (section 4.3.1.4) to place the FRCC considerations and recommendations in a better context.

- 2) Y/R increases resulting from MLS increases over the 1996-2013 period have undoubtedly contributed to maintaining high landings, however, there's no quantification of Y/R increases or even mention of them.

Assessment team's response: there is no information on the Y/R trends.

- 3) Although there's no way to quantify it, increased egg production associated with size-limit increases have likely resulted in increased recruitment - again no mention of this.

Assessment team's response: some considerations about egg production and reproductive capacity (reference to cohort-1 lobster abundance) were added in the text (section 4.3.1.2-Production, and section 4.3.1.5).

- 4) In very large measure, continuing favourable environmental/ecological conditions are part of the ongoing strong recruitment since 1995. There should be some consideration of the overall big picture to provide some context for the very rosy picture portrayed by the high landings of the past 15-20 years.

Assessment team's response: the assessment is based on the best available information. We cannot speculate on the current situation. We mentioned environmental conditions in several places in the text.

- 5) A comparison of size frequencies for commercial lobsters from 1996 and 2012 (or latest year available) would have been most informative.

For UoC 1, Figure 25 shows that comparison. A comment was added.

For UoC 2, a section on size frequency distribution was added.

- 6) Estimates of exploitation rate are a vital part of any assessment. Their absence for 3 of the 4 areas of UoC 1 for the past 10 years significantly compromises this one.

Assessment team's response: the assessment team agrees, and the text was revised.

- 7) Increased abundance of berried females is an extremely important consequence of the 1996 to 2013 size-limit increases. The series of figures (28-33) represents a dis-service to the overall results. A table summarizing CPUEs for sizes < L50, L50 - 95mm and >95mm for 1996 and 2013 would have been most informative.

Assessment team's response: Figures 28-33 are clear enough to show the increase of CPUEs of berried females. Requested data are not available, however, a new table (Table 22) illustrating that increase was provided.

- 8) Reference points based on landings are tenuous at best. Not knowing the current exploitation rate in 3 of the 4 LFAs in UoC 1 makes this especially so. In addition, not having a removal reference (maximum allowed exploitation rate in healthy zone) makes these reference points questionable. There should be some quantification of SSB, especially at the LRP. Reasonable estimates could be generated from landings using current exploitation rates and early-season at-sea sampling.

Assessment team's response: reference points based on landings can be criticized. However, they were peer reviewed and approved.

- 9) Figure 37 from FRCC 2007 is very much outdated. Table 24 should include size at 50% maturity (L50) for each area. Rather than quote now meaningless results from FRCC 2007, which doesn't capture the substantive MLS increases in 2011 and 2013, it would be much more appropriate and relevant to provide some quantification of the E/R increase resulting from the overall 1996 to 2013 MLS increase.

Assessment team's response: as mentioned above, the FRCC recommendations were placed in the text (section 4.3.1.4).

- 10) The only way reductions in nominal effort can have an impact in terms of stock conservation is if the reduction is great enough to reduce the exploitation rate. This aspect of effort reduction programs is consistently ignored.

Assessment team's response: the assessment team agrees. This caveat is now mentioned in the text.

- 11) There is no consideration of the female lobster reproductive cycle and how population egg production is severely limited by high exploitation rates in the fishery. Once a female lobster matures, it basically follows an alternate year molt/spawn cycle which means that those females that mature at sizes equal to and larger than MLS molt and grow to that size in one summer and are exposed to high exploitation rates in the next fishing season before getting the chance to spawn in the summer of that year. This means that the bulk of population egg production is by females smaller than MLS which for the most part are spawning for the first time and producing lower quality eggs – in this latter regard, the importance of increasing egg production by larger, multiparous females should be highlighted.

Assessment team's response: the assessment team agrees. It has to be considered, and despite the fact that reproduction relies essentially on primiparous females, production indicators (berried females, abundance of pre-recruits, abundance of cohort-1 lobsters) are positive. However, this comment was inserted in the background section.

- 12) LFAs 32 to 38 all have MLSs well below L50. These are part of the large SW Nova, Bay of Fundy, Gulf of Maine, Offshore lobster stock-recruitment complex. For these LFAs some detailed consideration of possible recruitment processes is needed in the appropriate background section along with some rationalization of exploitation rates in their fisheries in the context of MLSs being so much lower than L50s. This needs to be mentioned in the appropriate rationales of evaluation tables.

[Assessment team's response:](#) in the absence of published scientific information, it is difficult to speculate about the resilience of populations, despite high exploitations rates and MLS below the SOM₅₀.

I read P1 background sections for UoCs 2-4 without comment. While they contain much more quantitative information, the foregoing comments should be considered for each.

The remainder of this review is focused on the evaluation tables – many detailed comments re PI 1.1.1 in particular are highlighted in the tables. These are an integral part of the review.

[Assessment team's response:](#) these comments were taken into consideration in the revised tables.

Rationales don't provide adequate explanation for scoring the various elements of the SICA and PSA tables or how equivalent MSC scores are derived – footnotes would be helpful.

[Assessment team's response:](#) elements were added.

I have not flagged the many instances of incorrect English in text and tables – serious editing is required.

[Assessment team's response:](#) the assessment team undertook and completed a thorough editorial review of the report.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

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
Example:1.1.2	No	No	NA	<i>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 Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.</i>	
1.1.1				RBF used for all 4 UoCs – see below.	No response required.
1.1.2				Default 80 for all 4 UoCs – RBF used for 1.1.1.	No response required.
1.1.3				Stock is not depleted in any of the 4 UoCs.	No response required.
1.2.1	Yes	Yes	NA	UoC 1 – See comment in table. Even though FRCC 2007 is outdated, it is cited as though it were current. At the time it provided qualitative statements re the degree to which the E/R doubling objective was achieved. There have been substantive further MLS increases in some of the UoC 1	We agree that the objective of doubling egg production was not a reference point in the sense of a PA. Nevertheless, it was used as a reference to assess the effectiveness of conservation plans requested by the DFO Minister in 1997. A Precautionary Approach. Framework was implemented by DFO in

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
				<p>LFAs. Surely, someone could have a quick look at the relevant original E/R analysis to approximate the extent to which E/R has been increased overall. Even though the original models did not estimate egg production in an unfished population very well, in a relative sense they can still provide an approximation of E/R increases associated with given MLS increases, if newer models/analyses are not available.</p> <p>UoC 2 – see comments in table.</p> <p>UoC 3 – ok but consider foregoing comments.</p> <p>UoC 4 – ok but consider foregoing comments.</p>	<p>2009 which required to define limits. PA reference points were adopted for UoC1 in 2014. The text was modified both in the table and in the background to reflect this. Reference to the possible increase in egg production due to MLS increase was added in the background section.</p> <p>The text was corrected accordingly.</p>
1.2.2	Yes	Yes	Yes	See Condition 1 above.	No response required.
1.2.3	Yes	Yes	NA	No further comment.	No response required.
1.2.4				Default 80 for all 4 UoCs – RBF used for 1.1.1.	No response required.

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	Yes	See Condition 2 above. However, since herring and mackerel are not caught in lobster traps, they are not "retained" species. It seems more appropriate to consider bait use as part of ecosystem impacts.	According to MSC CR CB3.5.5 <i>The assessment team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.</i>
2.1.2	Yes	Yes	Yes	See Condition 3 above.	No response required.
2.1.3	Yes	Yes	NA	No further comment.	No response required.
2.2.1	Yes	Yes	NA	RBF used for only main bycatch species in UoC 1. For UoCs 2-4, some of the more common species should be identified and their %s provided if possible.	For UoCs 2-4, the assessment team concluded that there are no main bycatch species and that the occurrence of bycatch species in the Maritimes Region lobster fisheries is negligible. Common non-target species and % are given in section 4.4.2.2 p. 144 of the report.
2.2.2	Yes	Yes	NA	No further comment.	No response required.
2.2.3	Yes	Yes	Yes	See comment in table re scoring issue c for UoC 1 and Condition 4 above.	For UoC 1, the misprint in scoring issue c has been amended (60a rather than 60c).

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
2.3.1	Yes	Yes	NA	No further comment.	No response required.
2.3.2	Yes	Yes	NA	No further comment.	No response required.
2.3.3	Yes	Yes	NA	No further comment.	No response required.
2.4.1	Yes	Yes	NA	No further comment.	No response required.
2.4.2	Yes	Yes	NA	No further comment.	No response required.
2.4.3	Yes	Yes	NA	No further comment.	No response required.
2.5.1	Yes	Yes	NA	No further comment.	No response required.
2.5.2	Yes	Yes	NA	No further comment.	No response required.
2.5.3	Yes	Yes	NA	No further comment.	No response required.
3.1.1	Yes	Yes	NA	No further comment.	No response required.
3.1.2	Yes	Yes	NA	No further comment.	No response required.
3.1.3	Yes	Yes	NA	No further comment.	No response required.

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	Yes	NA	No further comment.	No response required.
3.2.1	Yes	Yes	NA	No further comment.	No response required.
3.2.2	Yes	Yes	NA	No further comment.	No response required.
3.2.3	Yes	Yes	NA	No further comment.	No response required.
3.2.4	Yes	Yes	Yes	See Condition 5 above and note re heading of Table E1.3 on p.419.	Noted for Condition 5. Comment at p.419 is about the number of the condition which was not specified. The assessment team adds the number (Condition 5).
3.2.5	Yes	Yes	NA	No further comment.	No response required.

Any Other Comments

Comments	Conformity Assessment Body Response

--	--

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	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	No	No	<p>UoC 1 – To suggest that the consequence of fishing on reproductive capacity is negligible is a stretch considering the recruitment overfishing concerns raised by FRCC in 1995 based on E/R analyses indicating E/R at only 1% or less of an unexploited population. Quick review of these early E/R analyses for selected SGSL populations would provide a basis for quantifying the extent to which E/R has been increased as a result of all the MLS increases. In fact, nowhere in the report is there any real quantitative, before (1996)/after (2013), comparison of any detail of population biology. All that is provided is very qualitative descriptions of certain improvements during the more recent part of the time series.</p> <p>I don't doubt that an MSC score of 80 can be justified for this UoC, but the rationale(s) provided really don't cut it. Maybe even an amended score of 90 can be justified, but some real quantitative information is needed. There are several additional comments re UoC 1 in Table 1.2.1a.</p>	<p>The consequence of fishing on reproductive capacity is considered as moderate (score of 2).</p> <p>There is no calculation of the E/R values since the 2007 FRCC's report. The improvement is inferred from the increasing abundance of berried females and of 1-yr old lobsters. This is now well mentioned in the background section.</p> <p>We disagree that the rationale is based only on qualitative information. It is based on the data provided in the background section. As noted by the second reviewer, the team felt it was not necessary to reproduce all the information presented elsewhere. However, some figures are provided.</p> <p>Comments on 1.2.1a were considered in the table.</p>

			UoC 2 – The conclusion that size structure is the most vulnerable component needs reconsideration. While not as weak as for UoC 1, rationales tend to be superficial and qualitative. The MSC score of 80 can be justified but rationale(s) would benefit greatly from some quantitative comparisons, as above for UoC 1. There are additional comments re UoC 2 in Table 1.2.1a. The fact that MLS is well below L50 in LFAs 32 and 33 requires some description/consideration of possible recruitment processes in these areas.	As for UoC1, the team did not feel it was necessary to reproduce all the data provided in the background section. However some figures are provided. In the absence of published scientific information, the team was unable to make hypotheses on recruitment processes.
2.1.1				
2.2.1				
2.4.1				
2.5.1				

For reports assessing enhanced fisheries:

<i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i>	Yes/No	Conformity Assessment Body Response:
<u>Justification:</u>		

Peer Review Report B

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	Yes	Conformity Assessment Body Response
None of the conclusions and scoring are found to be completely inappropriate. A few instances exist where the scoring might be adjusted slightly but not to the point of failing a PI.		No response required.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes	Conformity Assessment Body Response
The conditions raised appear to be appropriate to the findings and scoring. The client action plan will be a key determining factor in whether the affected PIs meet the SG 80 outcome within the specified timeframe. This appears to be especially true in the mackerel bait case where overall existing information is clearly inadequate.		The assessment team acknowledges the reviewer for his comment.

If included:

Do you think the client action plan is sufficient to close the conditions raised?	Yes	Conformity Assessment Body Response
All action plans appear to be adequate but the Action Plan for 2.1.2 across all UoCs should include development of baseline data on the quantity of Mackerel used in total and from various fishery sources.		The Client Action Plan for both PIs 2.1.1 and 2.1.2 include actions to quantify mackerel used as bait. “Further, the client will work to define methods to collect adequate proxy information to benchmark and monitor mackerel bait use”, and “The client, with the support of other participating parties and in consultation with harvesting representatives, will define how to reduce mackerel bait use and the method for ongoing data collection and reporting of mackerel bait use”.

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

General Comments on the Assessment Report (optional)

This Assessment Report is essentially well written but does contain a few spelling and grammatical errors, such as incorrect tenses or incorrect sentence subjects (singular vs. plural). These should be picked up in a final proof-reading. Just one example, on p. 18: was “genetically distant” meant to genetically distinct”?

Assessment team response: the assessment team undertook and completed a thorough editorial review of the report.

Much of the body of the Assessment Report contains information that applies to either individual UoCs or to all of them. For this reason a good deal of the Peer Review comments will be identical in the latter cases.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

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
Example:1.1.2	No	No	NA	<i>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 Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.</i>	
1.1.1	RBF used for scoring.	RBF used for scoring,	N/A	RBF used for scoring all UoCs but extremely lengthy renditions of stock assessment and related information are still presented in the main body of report. It would be useful to have a comment in the scoring table as to why this PI is scored at 85.9 for UoCs 2, 3 and 4 as compared to 90 for UoC 1.	The assessment team agrees that the information presented in the rationales is somewhat redundant with the background section. The team felt necessary to highlight the main conclusion to justify the final score. The difference of scoring between UoC1 and UoCs 2, 3 and 4 is clearly explained in the section Determination of final score for PI 1.1.1 (use of the Table CC19: Rules for use of SICA and PSA scores) at p. 413.
1.1.2	Default score of	Default score of 80	N/A	RBF used for scoring all UoCs but extremely	See above.

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
	80 as RBF used for PI 1.1.1 Stock Status	as RBF used for PI 1.1.1 Stock Status		lengthy renditions of stock assessment and related information are still presented in the main body of report.	
1.1.3	Y	Y	N/A	Not scored as 1.1.1 and 1.1.2 were assessed with RBF.	No response required.
1.2.1	Y	Y	N/A	<u>UoC 1</u> The score of 85 is appropriate for this PI based on the information provided in the main body of the report on the manner in which the UoC 1 fishery is managed. <u>UoCs 2-4</u> The score of 85 seems appropriate for this PI based on the information provided in the main body of the report on the manner in which the UoC 2 fishery is managed. The same scoring was given for UoCs 3 and 4 even though the differences in the commentary for all three UoCs are relatively	The assessment team agrees that scoring and rationale may be identical for different UoCs. However, the assessment team decided to proceed UoC by UoC, as it would be easier for the stakeholders to follow the assessment.

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
				minor in concluding that a robust Harvesting Strategy exists in each case. One Justification write-up, with the differences among UoCs identified, could have accomplished the same result.	
1.2.2	Y	Y	Y	<u>All UoCs</u> The score of 70 is appropriate for this PI as no well defined and effective harvest control rule is presently in effect in the UoCs.	No response required.
1.2.3	Y	Y	N/A	<u>All UoCs</u> The score of 80 is appropriate for this PI based on the extent and quality of data available for all UoCs. Again, it is questionable whether three separate scoring write-ups are necessary to arrive at the same conclusion and scoring for the Maritimes UoCs.	See above.
1.2.4	Default 80 RBF	Default 80 RBF		In all UoCs Default 80 RBF used for 1.1.1	No response required.

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
	used for 1.1.1 Stock status.	used for 1.1.1 Stock status.		Stock status.	
2.1.1	Yes, but data on the source of mackerel used as bait needs to be revisited for all UoCs.	Yes on the rationale, but information on mackerel used and the sources needs to be revisited.	Y	The score of 60 is appropriate for this PI for all UoCs based on the use of mackerel and other species as bait in the UoC 2 fishery. However, the estimated amounts of mackerel used as bait in all UoCs cannot all come from Canadian and US fisheries. On p.141, the total mackerel used in all UoCs in 2012 as bait is given as 32,153 mt. The Canadian Quota Report for that year shows a total recorded catch of 4,410 mt. Even allowing for the 13% estimated coming from US fisheries, this leaves a difference of some 23,600 mt; which seems a large amount to be accounted for by unreported bait fisheries. The real situation is that large amounts of mackerel bait are now coming from non-North American Asian sources. This points out the need for accurate	The assessment team acknowledges the reviewer for the comment. The typo on p.141 (now 142) was corrected and a new reference on the estimate of amount of bait used in the Maritimes was added. The scoring tables were amended as well: "Harnish and Martin Willison (2008) examined lobster fishery bait-to-catch ratios in Nova Scotia. Results showed that the estimated amount of bait required to catch each lobster ranged from 185 g (November) to 1455 g (April) for average months during the 2002/03, 2003/04 and 2004/05 fishing seasons. The estimated amount of mackerel, rock crab and herring used as bait in 2012 was 8,153 t, 5,512 t and 7,601 t respectively, for all combined LFAs."

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
				<p>statistics to be gathered on bait use in this and other baited gear fisheries.</p>	<p>“Total landings of Canada Atlantic mackerel were 6,468 t and 7,431 t in 2012 and 2013, respectively. Landings of Atlantic mackerel in US were 6,019 t and 5,250 t in 2012 and 2013, respectively.”</p> <p>The reference to 13% of mackerel uses as bait come from the US Atlantic fisheries was removed as this percentage is in reality higher.</p> <p>The assessment team did not find any indication of the use of mackerel coming from non-North America sources but is aware that mackerel from Asian sources could be considered as a new source for bait purpose.</p> <p>The Client Action Plan for both PIs 2.1.1 and 2.1.2 include actions to quantify mackerel used as bait.</p> <p>“Further, the client will work to define methods to collect adequate proxy information to benchmark and monitor mackerel bait use”, and “The client, with 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
					support of other participating parties and in consultation with harvesting representatives, will define how to reduce mackerel bait use and the method for ongoing data collection and reporting of mackerel bait use".
2.1.2	Yes, but data on the origin of mackerel used as bait needs to be re-visited for all UoCs.	Y	Y	Comments above on amounts of Mackerel coming from Canadian fisheries and other sources are relevant.	See response above.
2.1.3	Y	N	N/A	<u>UoC1</u> The score of 90 given this PI should be lower (80?) because of uncertainty over amount of mackerel used as bait and the setting of the 2014 TAC well above that recommended in the scientific advice. <u>UoCs 2, 3 and 4</u>	The assessment team disagrees. Atlantic mackerel uses as bait is purchased by lobster fishermen to directed fisheries, so the amount of bait used is already accounting into mackerel fisheries management system and taking into account in mackerel stock assessment. Landings of mackerel are provided, and the

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 score of 85 given this PI should be lower (80?) because of uncertainty over amount of mackerel used as bait and the setting of the 2014 TAC well above that recommended in the scientific advice.	amount of bait used including mackerel has been investigated and are and provided. Also the setting of the TAC for mackerel has nothing to do with this PI which deals with the information and monitoring of retained species.
2.2.1	Y	Y	N/A	For UoC 1, comments in RBF section below. The score of 100 assigned to this PI is the logical conclusion for the UoC 2 lobster fishery. Based on available information, Assessment team correctly concluded that there is no main bycatch species and considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is negligible. This conclusion and scoring also applies to UoCs 3 and 4.	No response required.
2.2.2	Y	Y	N/A	The score of 80 assigned to this PI is the logical conclusion for the UoC 1 lobster fishery.	No response required.

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 score of 80 assigned to this PI is the logical conclusion for the UoC 2 lobster fishery, as it also for the UoC 3 and 4 fisheries.	
2.2.3	y	Y	Y	<p>The score of 70 is appropriate based on the absence of bycatch data collection in the UoC 1 fishery.</p> <p>The score of 75 is appropriate based on the absence of bycatch data collection in the UoC 2 fishery. This conclusion and score also applies correctly to the UoC 3 and 4 fishery.</p>	No response required.
2.3.1	Y	Y	N/A	The score of 100 is appropriate based on the available information and traditional knowledge of interactions with ETP species in this fishery. This score is assigned across all UoCs.	No response required.
2.3.2	Y	Y	N/A	The score of 95 is appropriate given the level of ETP interaction in this fishery and	No response required.

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 Canadian system for protecting such species. This score is assigned across all UoCs.	
2.3.3	Y	Y	N/A	The score of 80 is the appropriate one based on the existence of SARA logbooks but the absence of observer coverage. This score is assigned across all UoCs.	No response required.
2.4.1	Y	Y	N/A	The score of 80 is the appropriate one because no habitat impact issues have been identified but also because no specific evidence is available from a habitat specific study to show the fishery is highly likely to reduce habitat structure and function to a point where there would be serious or irreversible harm. This score is assigned across all UoCs.	No response required.
2.4.2	Y	Y	N/A	The score of 95 is justified by the	No response required.

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
				information presented and the conclusion there have been no issues or concerns identified to indicate negative habitat impacts of lobster fishing. This score is assigned across all UoCs.	
2.4.3	Y	Y	N/A	The score of 90 is appropriate based on the lack of any formal documents describing the changes in the habitat distribution over the time, preventing the fishery from meeting 100c. This conclusion is the same across all UoCs and this score is assigned across all UoCs.	No response required.
2.5.1	Y	Y	N/A	The conclusion that there is no indication that the fishery causes serious or irreversible harm to habitats is justified as well as the score of 100. This conclusion is the same across all UoCs.	No response required.
2.5.2	Y	Y	N/A	The overall conclusion that there is no	No response required.

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
				indication that the fishery causes serious or irreversible harm to habitats is justified as is the score of 100. This conclusion is the same across all UoCs.	
2.5.3	Y	Y	N/A	The conclusions that no monitoring of bycatch data is conducted to assess ongoing mortalities to all bycatch species, that there has been no direct testing by the way of before-after fishing comparison of the fishing grounds and that no observer coverage is available to verify the information provided by the fishermen in the SARA logbooks prevents the fishery from meeting 100e. Therefore the score of 80 is justified. These conclusions and scoring are the same across all UoCs.	No response required.
3.1.1	Y	Y	N/A	The score of 90 for this PI is justified by the conclusions taken on the available information and it applies to all UoCs.	No response required.

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
3.1.2	Y	Y	N/A	The score of 90 for this PI is justified by the conclusions taken on the available information including the impossibility of determining the extent to which the use of information is explained. This applies to all UoCs.	No response required.
3.1.3	Y	Y	N/A	<p>The score of 90 is justified by the conclusion that the precautionary approach is explicit but not required in the lobster fishery management policy for the UoC 1 fishery.</p> <p>The score of 90 is justified by the conclusion that the precautionary approach is explicit but not required in the lobster fishery management policy for the UoC 2 fishery. This conclusion and scoring also applies to UoCs 3 and 4. It hardly seems necessary to do two separate scoring write-ups on this PI when the only essential difference is where the two DFO Regions are on development of their precautionary approach for lobster.</p>	No response required.

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	Y	N	N/A	The score of 100 is little high for this PI in that the take-up of the recent licence buy-back program could be taken as indicating there is still excess fishing capacity in this fishery. This conclusion and this observation applies to all UoCs.	The assessment team disagrees. The stated purpose of DFO's ALSM Program was to improve the economic performance of the lobster enterprises in the Gulf and Maritime provinces. Fewer licence holders and lobster traps, coupled with a robust and healthy resource, means higher average landings for the remaining enterprises. While vessel viability has improved considerably since 2009, it is difficult to say if excess capacity is a threat to the fishery's performance in 2014.
3.2.1	Y	N	N/A	It is not clear from the information provided that UoC 2 (and 3 and 4) merits a score of 80 while UoC 1 receives 100. In particular, it is not obvious why the objectives for UoCs 2, 3 and 4 are judged to be less time-period specific than those for UoC 1. It appears to be based on the new IFMP that exists for SGSL lobster. This differential might be clarified in the first surveillance audit.	The coming into force of the fishery's first IFMP (during the fishery assessment process) was a factor in the score for this PI for UoC1. The score is identical to the score that was awarded for the PEI lobster fishery assessment whose Lobster Fishing Areas (LFAs) are contiguous to those identified in this fishery assessment. Regarding UoCs 2, 3 and 4, the Assessment Team determined

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
					that the 2011 IFMP's objectives for the lobster fishery were not been well-defined as being short term and long term, nor were associated timeframes attributed. While the Assessment Team is satisfied that the objectives are very likely measurable based on the IFMP's tactical measures, it found no evidence to conclude that the objectives were demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2; hence it concluded that SG (a) warranted a score of 80.
3.2.2	Y	Y	NA	The score of 95 assigned to this PI seems appropriate based on the information presented and the conclusions stated for this UoC fishery (as well as 3 and 4). But in terms of consistency, it is not obvious why this PI was given a score of 90 in UoC 1 for essentially the same type of decision making process.	The higher score awarded for UoCs 2, 3 and 4 is explained by the "Yes" assigned to SG 100 (d) in contrast to a "No" for UoC 1. The Assessment Team determined that the established 2011 IFMP for UoCs 2, 3 and 4 did provide comprehensive reporting of information on the performance of the fishery-specific management system in contrast to the IFMP for UoC 1 which was

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
					only formalized near the conclusion of the fishery assessment.
3.2.3	Y	Y	N/A	The score of 95 was applied across all UoCs on the basis that there is no evidence of significant recidivism or systematic non-compliance in the lobster fisheries. However, is the exact same score across all UoCs realistic when four different fisheries, several provinces and two separate DFO Regions are involved?	The evidence provided during the site visits was generally consistent across all UoCs in regard to the level of compliance in the LFAs. Industry stakeholders all reported that the level of recidivism in the fishery was very low (a few cases per year) and that incidents of systematic non-compliance by fishers or the general public were negligible.
3.2.4	Y	Y	Y	The conclusion that "there was no documented evidence of a comprehensive research plan that provides the management system with a coherent and strategic approach to research across P1, P2 and P3 that provides reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2, seem justifies in the case of this PI. This conclusion was properly applied across	No response required.

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
				all UoCs.	
3.2.5	Y	Y	N/A	The conclusion that "The fishery-specific management system is subject to regular internal and occasional external review is justified by the information presented. This conclusion was appropriately applied accross all UoCs.	No response required.

Any Other Comments

Comments	Conformity Assessment Body Response
There is an excess of information provided in several sections of the main body of the report that seem to go beyond what was necessary to support the conclusions reached. This especially applies to the details presented in the stock assessment, compliance and enforcement and research plan sections.	The assessment team agrees that the information presented in the rationales is somewhat redundant with the background section. The team felt necessary to highlight the main conclusion to justify the final score.

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	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	N	Y	It is difficult to grasp why RBF was necessary for this PI in view of the voluminous detail that was presented on stock assessment and related activities in all the assessed fisheries. Information and conclusions from scientific assessments seem to be included in the RBF scoring results.	<p>The reason why the RBF was used was added in the background section of the report.</p> <p>Despite the amount of scientific information available for all UoCs, the team decided to assess those fisheries using the Risk Based Framework (RBF) considering the following rationale:</p> <ul style="list-style-type: none"> - There is no direct measurement of lobster biomass (empirical or analytical); - There are no biologically-based reference points defined for the fisheries, reference points are based on landings; - The status of the lobster stock is assessed using indicators (fishing pressure, abundance, and production) derived from fishery-dependent and fishery-independent data; - It is not currently possible to assess the uncertainty.
2.1.1	N/A	N/A		
2.2.1	Y	Y	Based on the lack of data for this PI in UoC 1.	No response required.

2.4.1	N/A	N/A		
2.5.1	N/A	N/A		

For reports assessing enhanced fisheries:

Does the report clearly evaluate any additional impacts that might arise from enhancement activities?

Yes/No

Conformity Assessment Body Response:

Justification:

Appendix 3. Stakeholder submissions

Stakeholder's comments

From: Veronika Brzeski [<mailto:lfa27board@gmail.com>]

Sent: 24 January 2015 00:54

To: Orla Minogue

Cc: R.J. (Bob) Allain; Geoff Irvine; Peter Norsworthy; Chris Harris; David Ferguson; John Tremblay

Subject: Re: Notification of Release of Public Comment Draft Report for Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence Lobster Trap Fisheries

Dear Ms Minogue,

I have in the past responded to SAI global with information on the research done by the LFA27 Management Board.

We have been collecting data on lobster since 2011.

LFA27 is in UoC 2 and, once again, there is no mention of our activity.

Please find included here our year end report in 2013 and a recent PDF of a presentation we have made at the Lobster Advisory Committee. We would appreciate our efforts in monitoring our stock health AND in collecting by-catch data be duly recognized in the MSC report. We have now 4 years of at-sea data, larval data and have inspired our fishermen to vote for yet another size increase (in 2014 from 81 to 82.5mm). Our LFA has implemented the most significant conservation measures by far of all the LFAs in the Maritime region (John Tremblay, Cape Breton Star, Jan 22, 2015) and we should be duly recognized.

Thank you,

Veronika Brzeski

Karen O'Connor
SAI Global Assurance Services
karen.oconnor@saiglobal.com

February 27, 2015

Dear Ms. O'Connor,

Please accept these comments for the MSC assessment of the Bay of Fundy, Scotian Shelf, Southern Gulf lobster trap fishery. Established in 1971, the Ecology Action Centre (EAC) is Atlantic Canada's oldest and largest environmental organization. The Marine Issues Committee of the Ecology Action Centre works locally, nationally and internationally towards conserving and protecting marine ecosystems and maintaining sustainable fisheries and vibrant coastal communities. We have a history of engaging on fishing policy, as well as certification.

The lobster fishery is one of Atlantic Canada's most vibrant and prosperous fisheries, one that allows independent fishers to continue their traditional livelihoods. The EAC actively supports this fishery and believes that the target species is currently being harvested within sustainable levels. We are also supportive and interested in the fact that the lobster fishery is effort controlled and that this is a departure from the majority of MSC certified fisheries. However, we do have a number of concerns about this fishery particularly related to Principle 2.

In general we are concerned about the lack of data regarding both retained and non-retained bycatch. We fear that the impacts on other species may be significantly underestimated in the current draft assessment, as the fishery lacks observer coverage, and the standard logbook practice is often not used by harvesters. While some Lobster Fishing Areas (LFAs) are engaged in data collection and science through the corresponding fishing association, this is not consistent across all LFAs.

The report states: "Based on the available documentation and information provided by DFO and lobster fishermen during site visit meetings, the Assessment team concluded that there is no main bycatch species and considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is negligible." We are concerned that scoring for Principle 2 is too high considering this assumption is based on verbal assurances and is not supported by data. We strongly encourage the team to provide some validation for this assumption. Data exists from several areas, as well as from limited observer coverage¹¹⁵, and we request that the assessment team use this information in its scoring on Principle 2. It is important that the bycatch levels in the lobster fishery be accurately characterized, as the fishing mortality particularly for groundfish species should be estimated in non-target fisheries.

| While we acknowledge that Condition 4 attempts to address data deficiency relating to retained and non-retained species, we suggest that more urgency is required around the quantification of species known to be caught in the lobster fisheries, and particularly those species that are COSEWIC assessed. We recommend that milestones require the following:

- Major discrepancies in data collection between LFAs are resolved by year 2.

115 For example, LFA 27 and the Guysborough Country inshore fishery are collecting bycatch data, and there is observer data from LFA 34 and 35, that was used for DFO's cusk Recovery Potential Assessment (RPA).

- The development of a system to fully quantify catch mortality is addressed by the end of year 4.

In addition, we strongly urge the assessment team to create an additional condition that requires the client to mitigate impacts on vulnerable bycatch species. Currently the client is only required to quantify the impacts, but this is only half of the equation.

We are particularly concerned about the lobster fishery's impact on Atlantic cod. As you may be aware, the most recent stock update for Scotia-Fundy cod ([4X5Y](#)) indicates that the population is not rebuilding, and that previous estimates that the species would reach the LRP within 36 years are incorrect. The situation for the Gulf of St. Lawrence cod is equally dire. Both populations have been assessed by COSEWIC as endangered [and are currently undergoing the legal listing process through the Species at Risk Act.](#)

Due to the lack of monitoring and the data deficiencies regarding bycatch in this fishery it is not possible to conclude that the fishery's impacts on this endangered species are insignificant. Moreover, we've been informed by DFO scientists that roughly 200-400MT¹¹⁶ of cod is currently being caught as bycatch in the lobster fishery in the Maritimes region. Unfortunately this data has not been incorporated into cod mortality estimates. In the meantime, the Scotia-Fundy Groundfish Advisory Council (of which we are a member) is considering conservation options for cod, including a reduction in the TAC.

Because cod may be impacted negatively by this fishery, we request that a condition is created that requires the client to quantify the impacts of the fishery on cod, and incorporates this data into overall cod mortality estimate. This condition should also require the fishery to develop a plan to minimize impacts on this species-at-risk, in order to be consistent with Principle 2 requirements. We believe that a live-release cod stewardship program would be practical way to mitigate impacts on cod, and that it could significantly benefit the Atlantic cod population.

We are pleased that the assessment team has identified the need to improve management as it relates to the use of mackerel for bait. EAC has recently been informed that the TAC is currently 12.5 times higher than the level recommended by science¹¹⁷, which poses a serious problem. Considering the lobster fishery's wide use of mackerel as bait, we are concerned that the fishery is adversely affecting mackerel stocks. Mackerel is an important food and income source for many Atlantic Canadians, and its sustainable management is critical to coastal community prosperity. We look forward to seeing the milestones for the conditions related to mackerel, and suggest that milestones contain:

- A requirement for a current quantification of mackerel use for bait by Year 2, considering the lobster harvest has increased since 2012.
- An assessment of alternate bait uses by Year 3.
- Evidence that the stock is not being adversely affected by the fishery by Year 4.

¹¹⁶

This is according to Don Clark, DFO scientist as communicated at the Scotia-Fundy Groundfish Advisory Meeting on January 20, 2015.

¹¹⁷

According to Brian Lester, DFO advisor for mackerel, the TAC for 2014 was 10,000 MT, while the science recommendation is that only 800 MT are caught. Email correspondence, February 25, 2015.

Ultimately, DFO will have to bring the mackerel TAC in line with science advice in order for this fishery to remain consistent with MSC principles, and we hope this will be reflected in the final assessment.

While we understand that marine mammal interaction is of concern, we also know that the US Atlantic lobster fishery has a much higher rate of interaction because of the number of traps and the lack of seasonality of the fishery.¹¹⁸ We suggest that the voluntary guidelines for whale entanglement be added to the certification documentation.

Thank you for considering our comments. If possible we would like to meet with the assessment team to discuss possible cod stewardship projects, as well as ways to increase observer coverage in the fishery.

Sincerely,



Catharine Grant
Marine Policy and Certification Coordinator

118

[Myers, Ransom A., et al. "Saving endangered whales at no cost." \(2006\).](#)



WWF *for a living planet*®

WWF-Canada
Atlantic Region Office
Suite 1202, Duke
Tower 5251 Duke Street
Halifax, NS Canada B3J 1P3

Tel: (902) 482-1105
Fax: 902) 482-1107
bsaier@wwfcanada.ca
[wwf.ca](http://www.wwf.ca)

WWF comments on the Public Comment Draft Report for the Nova Scotia and New Brunswick Lobster Eco-Certification Society - Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster (*Homarus americanus*) Trap Fishery

submitted to SAI Global

February 27th, 2015

Introduction

WWF actively engages as a stakeholder in a number of fishery assessments conducted by certification bodies in the MSC certification process in order to improve individual fisheries and to recognize advancements that fisheries have been making.

WWF has carefully considered select components of the Public Comment Draft Report (PCDR) for Nova Scotia and New Brunswick inshore lobster. We acknowledge that the draft assessment report identifies a number of conditions which, if met, will improve this fishery over time. While WWF is convinced that MSC's certification program is the most rigorous available, we are concerned that the draft report does not adequately consider or assess information regarding impacts to ETP species.

WWF's main concern with the draft assessment is with the evaluation of information and scoring rationale for performance indicators for Principle 2 within component 2.3, particularly with regards to the risk these fisheries pose to marine mammals and sea turtles. Given the clear gaps in knowledge that exist for marine mammals, and the associated uncertainties with the available information, it does not seem sufficient to score these indicators at 80 or above.

WWF's specific concerns are provided below. We also provide additional comments regarding the impacts to sensitive areas.

Incomplete consideration of ETP species

According to MSC (CB3.11.1), "*ETP species are defined as those that are recognized by national legislation and those that are listed in Appendix 1 of CITES*". Many Canadian cetacean species are listed in Appendix I CITES (<http://www.cites.org/eng/app/applications.php>), including blue, sei, humpback, minke, fin, sperm, bowhead and North Atlantic right whales. Based on the information provided in Tables 48 and 49, it is clear that the Assessment Team did not



WWF *for a living planet*®

appropriately considered all listed cetacean species which occur in the areas and coincide with the timing of these fisheries.

Finding that no fisheries incidents involving ETP species have occurred is incorrect

There have been numerous documented incidents involving marine mammals as well as leatherback sea turtles being entangled in Canadian inshore lobster fishing gear. Data does not appear to have been adequately gathered on this issue, despite it being provided by response networks to DFO as per permit requirements and DFO's participation in response operations. Based on the PCDR, only SARA logbooks seem to have been reviewed for these data. As there have been many reports of incidents involving ETP species throughout the certification areas but no records in SARA logbooks, they clearly are not sufficient for the evaluation of this threat.

As well, the completion of SARA logbooks is only required for SARA-listed species. As such, they would not include information on the many other CITES listed species, specifically cetaceans. We strongly recommend that the assessment of this threat be re-evaluated considering all available information. The assessment body should contact the Marine Animal Response Society and the Canadian Sea Turtle Network as well as the DFO Marine Mammal Advisors for data on these issues.

Related to this, there needs to be proper reporting of incidents and examination of carcasses and gear removed from entangled whales. This currently is not the case for all cetaceans and sea turtles. While there is a lot of effort done by local NGOs and partners, including DFO, response is often patchy and incomplete due to inaccessibility of animals or lack of funding.

Despite this, we do know that these animals get caught in lobster fishing gear. As well, there have been even more incidents of animals reported or examined where the gear involved is standard polypropylene green float rope used by many fisheries, including inshore lobster (e.g. see Johnson *et al.* 2005 *Marine Mammal Science*). Thus, the impact of this fishery cannot be considered to be insignificant. Without identifying the gear or implementing a mandatory gear marking program, the lobster fishery cannot be ruled out of these incidents.

The overall conclusion of the evaluation of PII impacts related to this issue is that there is *sufficient data available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species*. This conclusion is incorrect as there is no systematic collection of data on this threat to marine mammals and sea turtles (no observer data nor adequate completion of SARA logbooks). The Assessment Team also acknowledged that "*It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on the larger ETP species found in the fishery areas*". However, this uncertainty was not reflected in the scoring of this guidepost. Clearly there are very significant discrepancies.



Claim that seasons do not often overlap with the times of known whale concentrations, and therefore no risk of fisheries interactions, is incorrect

While there is some seasonality in their distribution, all of the ETP species which should have been considered in this assessment are found throughout the areas being considered for certification. For some species, such as minke whales, they are found year-round in Eastern Canadian waters and therefore, there is potential for interactions throughout the entire fishing season (interactions involving this species have been well documented for this fishery). Thus, the assumption that seasonality of fisheries or whale distribution would result in low or no potential for interactions is incorrect.

There are also two issues with the evaluation presented in the PCDR specifically in regards to endangered right whales. First, while for some LFAs in the Bay of Fundy the fishing season does not overlap with the primary months right whales are present (June-October), for others, including the Grey Zone and in the Gulf of St. Lawrence, the fishing season directly overlaps with the primary occurrence of right whales (see Figure 1 below for locations of observations of right whales in the Gulf of St. Lawrence). Recently, DFO-Maritimes implemented a poster campaign requesting right whale sightings and as a result, there has been a significant increase in the reporting of right whales throughout their Eastern Canadian range, particularly in the Gulf of St. Lawrence. We recommend the assessment body contacts Lei Harris for more information. As well, through passive acoustic monitoring by Scientists with DFO-Quebec, the presence of right whales in the Gaspé and Baie des Chaleurs Basins has been confirmed and indications are that the whale regularly frequents the Gulf of St. Lawrence at the end of summer and into the fall (DFO unpublished data). Thus, all indications are that this species does overlap with the lobster fishing seasons in several of the certification areas. Secondly, it has also been well documented that right whales have been observed in Canadian waters prior to June and after October, often overlapping with the lobster fishing season in several areas, including their core Critical Habitat. These data are available from multiple sources, including DFO.

Additional comments regarding the Evaluation of PII impacts on ETP species

The suggestion that because recovery strategies for some of these ETP species have been developed does not mean there has been any formal implementation of strategies or action plans to reduce or mitigate threats to these species from these fisheries. To date, these Action Plans have not been completed and there has been no formal implementation of any measures to reduce interactions of this fishery with marine mammals or sea turtles.

The voluntary measures which have been implemented by LFAs 33-34 as well as the strategy implemented by LFAs 36-38 (not cited in the PCDR; available at: <http://qmfa.nb.ca/wp-content/uploads/2012/09/Right-Whale-Mitigation-Strategy-2013.pdf>) are a good start to better understand the threat to right whales and do aim to reduce interactions, but these are just voluntary (i.e. not required) and there's been no effort to ensure or measure compliance. Hence, these cannot be used to formally quantify any reduction to risk nor be used to support the



statement that there is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species or the resulting score of 100 (nor even >80).

In several instances, there is mention that training courses in release techniques have been provided to license holders (e.g. p335, PII 2.3.2). This is not the case for the lobster fishery (nor any other fisheries except in relation to the release of leatherback sea turtles in the pelagic longline fishery). We are unaware of any voluntary or mandatory marine animal release training programs.

Information included in the PCDR on the North Atlantic right whale population is out-of-date. The population estimate is incorrect. While there has been no change in the status of the species, as of 2014, the population is estimated to be over 450 individuals. As well, there is no mention of their significant use of the Gulf of St. Lawrence. Right whales, particularly moms and calves, have been documented consistently in the waters off the Gaspé Peninsula and Western Cape Breton Island (see Figure 1 below). This information is available from DFO, as are the passive acoustic monitoring information mentioned above, and it's not clear why it was not considered in this assessment.

As a result of the above issues, we highly recommend a reevaluation of this issue following discussions with SARA division of DFO regarding at risk cetaceans and sea turtles and the examination of the actual data available on incidents with the inshore lobster fishery (available from local response networks as well as DFO).

Comments regarding consideration of the impacts to sensitive habitats

While Ecologically and Biologically Sensitive Areas (EBSAs) have been discussed, no explanation of how or if they were taken into consideration in assessing the impacts of the fishery on each of the ecological and biological components of the respective EBSAs where the fisheries take place could be found.

As well, the Assessment Team should review DFO's Science Response document 2014/044, which identifies potential sensitive benthic areas in the Bay of Fundy (Head Harbour/West Isles/Passages; Modiolus Reefs). Even though the Sensitive Benthic Policy and Risk Assessment Framework has been mentioned in the draft PCDR, it would be valuable to include information about how potential impacts from these fisheries (and potential ghost fishing from other areas) in these areas is being prevented. In addition, it is not clear how potential impacts from the fisheries or ghost fishing is being avoided for the sites identified by Kenchington et al (2010; CSAS Research Document 2010/041 on the delineation of coral and sponge concentrations in East Canada using spatial analysis). The paper is cited, however, there is no



for a living planet®

discussion or figure of the overlap of the actual fishing effort with those Vulnerable Marine Ecosystems. We would highly recommend that this evaluation is conducted.

Comments on Certification Recommendations and Conditions

The bycatch of ETP marine mammals and sea turtles is a national and international concern, particularly for SARA-listed species. Bycatch is one of the main reasons this fishery has been identified as "one to avoid or be highly concerned about" by several seafood choice guides. This is an issue that is very concerning to the conservation community as well as the general public when they are making seafood purchasing choices.

As evidenced above, the Assessment Team did not do an adequate job assessing the impacts of these fisheries on ETP species. Given the evidence available (but not considered) and the uncertainty, there should be a Condition related to the requirement of the collection of these data and the mitigation of impacts. This is required by law for many of these species under SARA. We strongly recommend a re-evaluation of the impacts on ETP species considering all available data and that a Condition is set to address this issue.

Overall conclusions

The assessment team did not adequately consider the impacts of these fisheries to ETP species. Given the above mentioned issues, we do not agree with the (primarily) SG100 scoring of PII related to ETP species and the general conclusions that *there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection* and that *there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species*. In order to achieve a score of SG80 or 100 for this performance indicator through qualitative assessment, MSC requires that the risk to be *very low*. Enough data and uncertainties exist with regards to the impacts to ETP cetaceans and sea turtles that the risk cannot be considered *very low*. We believe that the information that currently exists for cetaceans is insufficient to justify the given overall scores of >SG80.

As many of these ETP species are considered to be at risk or extremely vulnerable to fishing interactions, a precautionary approach must be considered. This is particularly important given the paucity of data regarding impacts to all of these species from this fishery (i.e. no observer coverage, poor or no SARA reporting, inaccurate consideration of other sources of data). As scientific information is unable to indicate whether or not this fishery is impacting these species, some of which are considered to be critically endangered, the burden of proof should fall to the fishery to demonstrate that it is "highly unlikely" to create unacceptable impacts to ETP species. Therefore, precautionary measures should be applied to account for this uncertainty until such a time that it is proven otherwise.



For some species, the removal of even a few individuals can have very significant impacts on the whole population and their recovery. The Assessment Team's finding that there is "no risk of serious or irreversible harm" (e.g. as stated on p152 and PII) is very concerning and potentially very damaging to the protection and recovery of these species.

A handwritten signature in black ink that reads "Tonya Wimmer". The signature is fluid and cursive, with the first name "Tonya" having a long, sweeping initial stroke.

Tonya Wimmer
Species Conservation Manager
WWF-Canada
Tel: (902) 482-1105 ext. 32
twimmer@wwfcanada.org

Assessment team's response

Dear Veronika,

Thank you for your interest and participation in the MSC fishery assessment of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fisheries.

You've expressed your concerns about the LFA 27 Management Board research activities not being mentioned in the Public Comment Draft Report published on the 22nd January 2015:

"I have in the past responded to SAI global with information on the research done by the LFA27 Management Board.

We have been collecting data on lobster since 2011.

LFA27 is in UoC 2 and, once again, there is no mention of our activity.

Please find included here our year end report in 2013 and a recent PDF of a presentation we have made at the Lobster Advisory Committee. We would appreciate our efforts in monitoring our stock health AND in collecting by-catch data be duly recognized in the MSC report. We have now 4 years of at-sea data, larval data and have inspired our fishermen to vote for yet another size increase (in 2014 from 81 to 82.5mm). Our LFA has implemented the most significant conservation measures by far of all the LFAs in the Maritime region (John Tremblay, Cape Breton Star, Jan 22, 2015) and we should be duly recognized."

Please find below the SAI Global assessment team's response to your submission.

The full assessment is based on the UoCs and not the individual LFAs, and aim to show the sustainable fishing practices of lobster harvesters in the UoC as a whole. However, the assessment team did recognize the efforts in conservation and research activities implemented by individual LFAs, including LFA 27.

Science projects on lobster have been mentioned in p.188 of the PCDR "ALSM projects were implemented in LFA 27, and were focused on science projects to collect, analyse and disseminate biological data which would contribute towards the management and biological sustainability of the lobster fishery industry, and governance projects to improve the LFA 27 Management Board capacity and better align the governance structure with the needs of fishermen (Brzeski 2011, 2014)". But they are also mentioned p. 227 in Table 69 summarizing the FSRS's lobster projects including projects LFA 27 is involved in.

The assessment team acknowledges that the bycatch data collection started in 2011 has not been mentioned in the PCDR. It was now included in section 4.4.2. Bycatch species.

Regarding conservation measures, the reduction of fishing effort in LFA 27 was mentioned in scoring tables of PIs 2.1.1 and 2.1.2. The assessment team has also mentioned the increase of the minimum legal size to 81 mm in LFA 27 in p. 132 of the PCDR.

The assessment team acknowledges another minimal legal size increase would be another step forward sustainability. I would like to confirm that subject to a positive certification decision, the team will review any changes in management measures, including change in minimum legal size, during surveillance audits.

Thank you, once again, for bringing concerns to the attention of the assessment team.

Yours sincerely

Geraldine Criquet, Ph. D.
Fisheries Assessment Officer
Assurance Services - EMEA

SAI Global Assurance Services Ltd / Global Trust Certification Ltd

3rd Floor, Block 3, Quayside Business Park
Mill Street
Dundalk, Co, Louth
Ireland

Phone: +353 (0) 42 932 0912
Mobile: +353 (0) 86 411 0951
Fax: +353 (0) 42 938 6864

Web: www.saiglobal.com/assurance
www.gtcert.com

Excellence.Assured.

Global Leaders in Conformity Standards, Assessments and Accredited Certification.
Global Leaders active in 26 Countries.
Global Leaders accredited to EN45011 / ISO 65 by INAB: Reg Scope 6002.

GLOBAL LEADERS IN ECO-LABEL CERTIFICATION

Please consider the environment before printing this e-mail

Ecological Action Centre
2705 Fern Lane
Halifax, NS B3K 4L3
Canada

7th April 2015

Ref: Your submission to SAI Global on the Public Comment Draft Report of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fisheries

Dear Catharine,

The assessment team appointed to conduct the MSC full assessment of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fisheries have reviewed your submission and have discussed the concerns that you have raised in relation to the retained and bycatch species. We do take your concern seriously and would like to make the following responses.

"In general we are concerned about the lack of data regarding both retained and non-retained bycatch. We fear that the impacts on other species may be significantly underestimated in the current draft assessment, as the fishery lacks observer coverage, and the standard logbook practice is often not used by harvesters. While some Lobster Fishing Areas (LFAs) are engaged in data collection and science through the corresponding fishing association, this is not consistent across all LFAs. "

Retained species

The assessment team considers the information available on the level of retained species adequate to assess the impact of lobster fisheries according to MSC Certification Requirements.

In the Southern Gulf of St Lawrence (UoC 1), under licence conditions, rock crab (*Cancer irroratus*), cunner (*Tautogolabrus adspersus*) and sculpin (*Myoxocephalus octodecemspinosus*) are allowed to be landed. However, in actual fishing practices, cunner and sculpin are not retained. Data on male rock crab caught during the lobster fishery are compiled from sales transactions and other statistics from DFO Fisheries and Aquaculture Management Branch. The amount of rock crab landed by lobster harvesters was incorporated in the last assessment of the rock crab stock in the SGSL. Landings of rock crab during the lobster fishery are shown in Table 44 (p.135) broken down by LFA and year.

In the Maritimes (UoCs 2, 3, 4), all inshore Lobster harvesters in LFAs 27-38 are authorized by licence condition to retain green crab (*Carcinus maenas*), rock crab (*Cancer irroratus*), and sculpin (*Myoxocephalus octodecemspinosus*). In addition, harvesters in LFAs 33-38 are authorized to retain Jonah crab (*Cancer borealis*) that is 130 mm and greater in length. However, in actual fishing practices, sculpin is not retained. If crab species are retained for the purpose of sale, the licence holder/operator is required to record and provide information in the Crab monitoring document (Crab 2002-12) regarding the fishing activities during each fishing trip and prior to returning to port. The licence holder is then required to supply a Dockside Monitoring Company with a copy of the report within 15 days after the end of each month during the Lobster fishing season. In contrast, Crab used for bait is to be reported in the Lobster log. Reported green Crab, rock Crab, Jonah Crab, and Unspecified Crab landings retained by Maritimes inshore lobster fisheries for resale between 2010 to present has ranged from 5.6-11.17 t, which represented less than 0.01% of the lobster total landings.

Regarding bait, the amount used by lobster harvesters has been estimated. Moreover, the Client Action Plan to address conditions on PI 2.1.1 and 2.1.2 related to the use of Canadian mackerel as bait includes an Action on the implementation of a monitoring system for mackerel used as bait.

Non-retained species (Bycatch species)

The assessment team acknowledges there is a lack of data on bycatch species. It's the reason why the Risk-Based Framework was used in the assessment of PI 2.2.1 for UoC 1. For Maritimes inshore lobster fisheries, data are available from at-sea observer activities and industry bycatch data collection. However, the assessment team considered the information on bycatch is not sufficient to detect any increase in risk to retained species. Therefore a condition for PI 2.2.3 has been assigned to all UoCs.

"The report states: "Based on the available documentation and information provided by DFO and lobster fishermen during site visit meetings, the Assessment team concluded that there is no main bycatch species and considered that the occurrence of bycatch species in the Maritimes Region inshore lobster fisheries is negligible." We are concerned that scoring for Principle 2 is too high considering this assumption is based on verbal assurances and is not supported by data. We strongly encourage the team to provide some validation for this assumption. Data exists from several areas, as well as from limited observer coverage, and we request that the assessment team use this information in its scoring on Principle 2. It is important that the bycatch levels in the lobster fishery be accurately characterized, as the fishing mortality particularly for groundfish species should be estimated in non-target fisheries."

The statement that bycatch is negligible in the Maritimes inshore lobster fisheries is not based on verbal assurances but on documented evidence: den Heyer et al (2010)¹¹⁹, Delorey (2013)¹²⁰.

Moreover, for greater clarity, the following references have been added to the Final Report and Determination: Pezzack et al 2014¹²¹ , LFA 27 Lobster Research 2014, DFO 2014d¹²², Harris and Hanke 2010¹²³.

Although the assessment team determined that the bycatch level in the Maritimes inshore lobster fisheries is low, we have modified the initial rational so as to now consider cod and cusk as main retained species; this required the re-scoring of the PI 2.2.1 (revised to 80).

"We are particularly concerned about the lobster fishery's impact on Atlantic cod. As you may be aware, the most recent stock update for Scotia-Fundy cod (4X5Y) indicates that the population is not rebuilding, and that previous estimates that the species would reach the LRP within 36 years are incorrect. The situation for the Gulf of St. Lawrence cod is equally dire.

¹¹⁹ den Heyer, C.E., Bundy, A., and MacDonald, C. 2010. At-Sea Catch Analysis of Inshore Scotian Shelf Lobster Fishery and 4VsW Commercial Index Groundfish Sentinel Fishery. Can. Tech. Rep. Fish. Aquat. Sci. 2890: vii + 39 p.

¹²⁰ Delorey, S. 2013. Overview of Incidental Bycatch and Live Discards for areas LFAs 31A and 31B. Based on the Guysborough County Inshore Fishermen's Association At-Sea sampling data from 2009-2013.

¹²¹ Pezzack, D.S., Denton, C.M., and Tremblay, M.J. 2014. Overview of Bycatch and Discards in the Maritimes Region Lobster Fishing Areas (LFAs) 27-33 based on *Species at Risk* (SARA) At-sea sampling 2009-2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/040. V + 27 p.

¹²² DFO 2014d. Update to the Recovery Potential for Cusk in Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/048.

¹²³ Harris, L.E. and A.R. Hanke 2010. Assessment of the Status, Treats and Recovery potential of Cusk (*Brosme brosme*). DFO Can. Sci. Advis. Sec. Res. Doc. 2010/004. vi + 23 p.

| Both populations have been assessed by COSEWIC as endangered and are currently undergoing the legal listing process through the Species at Risk Act." "Due to the lack of monitoring and the data deficiencies regarding bycatch in this fishery it is not possible to conclude that the fishery's impacts on this endangered species are insignificant. Moreover, we've been informed by DFO scientists that roughly 200-400MT of cod is currently being caught as bycatch in the lobster fishery in the Maritimes region. Unfortunately this data has not been incorporated into cod mortality estimates. In the meantime, the Scotia-Fundy Groundfish Advisory Council (of which we are a member) is considering conservation options for cod, including a reduction in the TAC."

Cusk is listed as Endangered under the COSEWIC but is not listed under the SARA. Atlantic cod (Laurentian South population) is listed as Endangered under COSEWIC and is under consideration to be listed under the SARA. The assessment team would like to clarify that according to the definition of Endangered Threatened and Protected (ETP) species under the MSC CR (CB3.11.1), both cod and cusk cannot be considered as ETP species.

As mentioned above, the assessment team now considers cod and cusk as main bycatch species based on the following.

Cod

Results from the special observer sampling during 2009-2010 lobster fishing season, as part of the 3-year SARA bycatch project (Pezzack et al 2014), show that 125 t and 210 t of cod were caught by lobster harvesters in LFAS 27-33 (UoC 2) and LFA 34 (UoC 3), respectively. These catches represented 0.4 % and 1% of the total catch in UoC 2 and UoC 3, respectively. Also, the Fishermen and Scientists Research Society at-sea sampling on the Scotian Shelf during the 2005-2006 fishing season showed that 145.8 t of cod were caught (den Heyer et al 2010), which represented 1.8% of the total catch in the UoC 2. Although these catches represented less than 5% of the total catch, the assessment team considers cod as main bycatch species due to the vulnerability of the species (MSC GCB3.5.2.). Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of the cod (PI 2.2.1 scoring issue b and PI 2.2.2 SG 80): lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps has been reduced over the years. There is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and some evidence from tagging studies that indicate cod survive after being captured and released from lobster traps (DFO 2005, Taggart et al 1995)¹²⁴.

Cusk

Results from the special observer sampling during 2009-2010 lobster fishing season, as part of the 3-year SARA bycatch project (Pezzack et al 2014), show that 8 t and 219 t of cusk were caught by lobster harvesters in LFAS 27-33 (UoC 2) and LFA 34 (UoC 3), respectively. These catches represented 0.03 % and 1.1% of the total catch in UoC 2 and UoC 3, respectively. A special sampling project was undertaken to estimate cusk bycatch in LFA 34 lobster fishery (Harris and Hanke 2010) and as you mentioned, the results were used for the cusk RPA. Results show that 461 t and 344 t of cusk were caught during the 2005-2006 and 2006-2007 fishing seasons, respectively. These catches represented 2.7% and 2% of the total catch during the 2005-2006 and 2006-2007 fishing seasons, respectively. Although these catches represented less than 5% of the total catch, the assessment team considers cusk as main bycatch species due to the vulnerability of the species (MSC GCB3.5.2.).

¹²⁴ DFO 2005. Proceedings of the Maritimes Provinces Regional Advisory Process on Scotia-Fundy Groundfish Stocks; 31 October – 3 November 2005. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2005/032.

Taggart, C.T., P. Penney, N. Barrowman and C. George 1995. The 1954-1993 Newfoundland cod-tagging database: statistical summaries and spatial-temporal distributions. Can. Tech. Rep. Fis. and Aquat. Sci. 2042.

Based on the nature of the lobster fisheries, the assessment team considers that a partial strategy exists to ensure that the lobster fisheries do not hinder the recovery of the cusk (PI 2.2.1 scoring issue b and PI 2.2.2 SG 80): cusk were legally landed from the lobster fishery until 1999 (Harris and Hanke 2010), then from this date cusk were not allowed to be retained. Also, lobster traps are not designed to catch fish, biodegradable panel is mandatory across all LFAs to prevent ghost fishing in the event of traps lost, there is a limited fishing season, and the number of licences and traps was reduced over the years. There is evidence that this partial strategy works based on the fact that cusk bycatch estimates are well below the 5% threshold, much lower than catches observed in groundfish longline fisheries in 4X and 5Z. According to the latest stock assessment, the mean cusk CPUE from the Halibut Industry Survey has been at or above the LRP for the last 3 years (DFO 2014e¹²⁵), and it appears that the population can sustain recent levels of fishing mortality without jeopardizing survival of the species considering Cusk CPUE in the Halibut Industry Survey has fluctuated without trend for the past 14 years (DFO 2014d¹²⁶).

“While we acknowledge that Condition 4 attempts to address data deficiency relating to retained and non-retained species, we suggest that more urgency is required around the quantification of species known to be caught in the lobster fisheries, and particularly those species that are COSEWIC assessed. We recommend that milestones require the following:

- Major discrepancies in data collection between LFAs are resolved by year 2.
- The development of a system to fully quantify catch mortality is addressed by the end of year 4.”

The Condition 4 assigned to all UoCs is to address the data deficiency relating to bycatch species only. As mentioned, the assessment team considers the information available on the level of retained species adequate to assess the impact of lobster fisheries.

The assessment team believes that the set milestones and the Client Action Plan match with your recommended milestones.

The Action 4 of Client Action Plan is “The client will consult with the DFO and other participating parties to define methods to collect adequate proxy information to reflect bycatch encounters in all LFA’s.” And by the Year 2, the client shall provide evidence that a system for bycatch data collection has been agreed and tested.

By Year 3, the client shall provide evidence that a system for bycatch data collection has been implemented within the fishery management system.

“Because cod may be impacted negatively by this fishery, we request that a condition is created that requires the client to quantify the impacts of the fishery on cod, and incorporates this data into overall cod mortality estimate. This condition should also require the fishery to develop a plan to minimize impacts on this species-at-risk, in order to be consistent with Principle 2 requirements. We believe that a live-release cod stewardship program would be practical way to mitigate impacts on cod, and that it could significantly benefit the Atlantic cod population.

In addition, we strongly urge the assessment team to create an additional condition that requires the client to mitigate impacts on vulnerable bycatch species. Currently the client is only required to quantify the impacts, but this is only half of the equation.”

The Condition 4 is to address the data deficiency relating to all bycatch species including cod. Although the assessment team acknowledges that all sources of mortality should be used to assess the cod stock status, under MSC CRv1.3, we cannot require that DFO incorporates impacts of lobster fisheries on cod in the overall cod mortality estimate as we do not assess the cod fishery.

¹²⁵ DFO 2014e. Stock Status Update of Cusk (*Brosme brosme*) in NAFO Divisions 4VWX5Z Under The Precautionary Approach Framework. DFO Can. Sci. Advis. Sec. Sci. Resp. 2014/019.

¹²⁶ DFO 2014d. Update to the Recovery Potential for Cusk in Canadian Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/048.

As discussed above, we consider that a partial strategy already exists to ensure that the lobster fisheries do not hinder the recovery of the cod, and there is evidence that this partial strategy works based on the fact that cod bycatch estimates are well below the 5% threshold and some the evidence from tagging studies that cod survive after being captured and released from lobster traps. Therefore an additional condition is not required.

"We are pleased that the assessment team has identified the need to improve management as it relates to the use of mackerel for bait. EAC has recently been informed that the TAC is currently 12.5 times higher than the level recommended by science, which poses a serious problem. Considering the lobster fishery's wide use of mackerel as bait, we are concerned that the fishery is adversely affecting mackerel stocks. Mackerel is an important food and income source for many Atlantic Canadians, and its sustainable management is critical to coastal community prosperity. We look forward to seeing the milestones for the conditions related to mackerel, and suggest that milestones contain:

- A requirement for a current quantification of mackerel use for bait by Year 2, considering the lobster harvest has increased since 2012.
- An assessment of alternate bait uses by Year 3.
- Evidence that the stock is not being adversely affected by the fishery by Year 4.

Although the assessment team considers the impact of lobster fisheries on the mackerel stock to be indirect (mackerel is not caught in lobster traps, mackerel used as bait is purchased from mackerel directed fisheries), we determined that there is no partial strategy in place to ensure that lobster fisheries does not hinder the recovery of the mackerel stock. Therefore a condition was assigned to PIs 2.1.1 and 2.1.2 with specific milestones. According to CR 27.11.1.2 The CABs should draft conditions and associated milestones to follow the narrative or metric of the PISGs used in the final tree. By Year 4, the client shall provide evidence that the successfully implemented partial strategy will work meaning that lobster fisheries do not hinder the recovery of the mackerel stock. As part of the Client Action Plan, monitoring of mackerel used as bait will be implemented, and the use of mackerel will be significantly reduced meaning alternative bait will be used. The client has the period of certification available to fulfil the requirements of the condition.

"Ultimately, DFO will have to bring the mackerel TAC in line with science advice in order for this fishery to remain consistent with MSC principles, and we hope this will be reflected in the final assessment."

The TAC has been set for the directed mackerel fishery. The current full assessment applies only to lobster fisheries. As the assessment team do not assess the mackerel directed fishery against MSC Principles and Criteria for Sustainable Fishing, we cannot require DFO to set the TAC for the directed mackerel fishery in line with science advice.

"While we understand that marine mammal interaction is of concern, we also know that the US Atlantic lobster fishery has a much higher rate of interaction because of the number of traps and the lack of seasonality of the fishery. We suggest that the voluntary guidelines for whale entanglement be added to the certification documentation."

The assessment team noted that voluntary practices are in place in LFAs 33 and 34, and in the Bay of Fundy (LFAs 35-38). These practices are described in p. 152 of the PCDR.

"voluntary standard practices for lobster fishery of LFAs 33 and 34 to reduce excess line in the water column for the protection of right whales have been implemented in 2009 in cooperation with WWF Canada. Also the Fundy North Fishermen's Association voluntary completed a ghost gear and marine debris removal at the mouth of the Bay of Fundy in summer and fall 2013. The purpose of this project was to reduce threats to marine mammals due to lost gears."

Thank you for considering our comments. If possible we would like to meet with the assessment team to discuss possible cod stewardship projects, as well as ways to increase observer coverage in the fishery.

Whilst the April 2014 site visit provided the opportunity to stakeholders to meet with the assessment team, I would like to confirm that subject to a positive certification decision, annual surveillance audits are another opportunity available to stakeholders to meet with the assessment team and discuss your concerns about the fishery. Stakeholders will be informed 30 days in advance of the scheduled surveillance audits.

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

Yours sincerely,

Géraldine Criquet

Fisheries Assessment Officer

Assurance Services - EMEA

SAI Global Assurance Services Ltd / Global Trust Certification Ltd

3rd Floor, Block 3, Quayside Business Park

Mill Street

Dundalk, Co, Louth

Ireland

Phone: +353 (0) 42 932 0912

Mobile: +353 (0) 86 411 0951

Fax: +353 (0) 42 938 6864

Web: www.saiglobal.com/assurance

www.gtcert.com

WWF - Canada
Atlantic Region Office
Suite 1202, Duke
Tower 5251 Duke Street
Halifax, NS
Canada B3J 1P3

15th April 2015

Ref: Your submission to SAI Global on the Public Comment Draft Report of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fisheries

Dear Tonya,

The assessment team appointed to conduct the MSC full assessment of the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence Lobster Trap Fisheries have reviewed your submission and have discussed the concerns that you have raised in relation to the impacts on ETP species and particularly marine mammals, and impacts on sensitive habitats. We do take your concern seriously and would like to make the following responses.

"Incomplete consideration of ETP species

According to MSC (CB3.11.1), "ETP species are defined as those that are recognized by national legislation and those that are listed in Appendix 1 of CITES". Many Canadian cetacean species are listed in Appendix I CITES (<http://www.cites.org/eng/app/appendices.php>), including blue, sei, humpback, minke, fin, sperm, bowhead and North Atlantic right whales. Based on the information provided in Tables 48 and 49, it is clear that the Assessment Team did not appropriately considered all listed cetacean species which occur in the areas and coincide with the timing of these fisheries."

The assessment team did appropriately consider all ETP cetacean species which occur in the areas and that coincide with the timing of the lobster fisheries. Fisheries under assessment are the Southern Gulf of St Lawrence (UoC 1: LFAs 23, 25, 26A and 26B), the Scotian Shelf (UoC 2: LFAs 27-33, and UoC 3: LFA 34), and the Bay of Fundy (UoC 4: LFAs 35-38) lobster fisheries (Figure 1).

Blue and fin whales are listed in Table 48 and in Table 49 along with humpback, and North Atlantic right whales.

According to MSC GCB3.11¹²⁷, Species listed under CITES Appendix 1 shall be considered ETP species, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered. Sei whale has not been considered by the assessment team as only the Pacific Population is listed as endangered under SARA and COSEWIC¹²⁸.

¹²⁷ Guidance to MSC certification Requirements v1.3: <http://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/msc-scheme-guidance-documents/guidance-to-the-msc-certification-requirements-v1.3>

¹²⁸ <http://www.dfo-mpo.gc.ca/species-especies/species-especies/seiWhale-PAC-rorqualboreal-eng.htm>

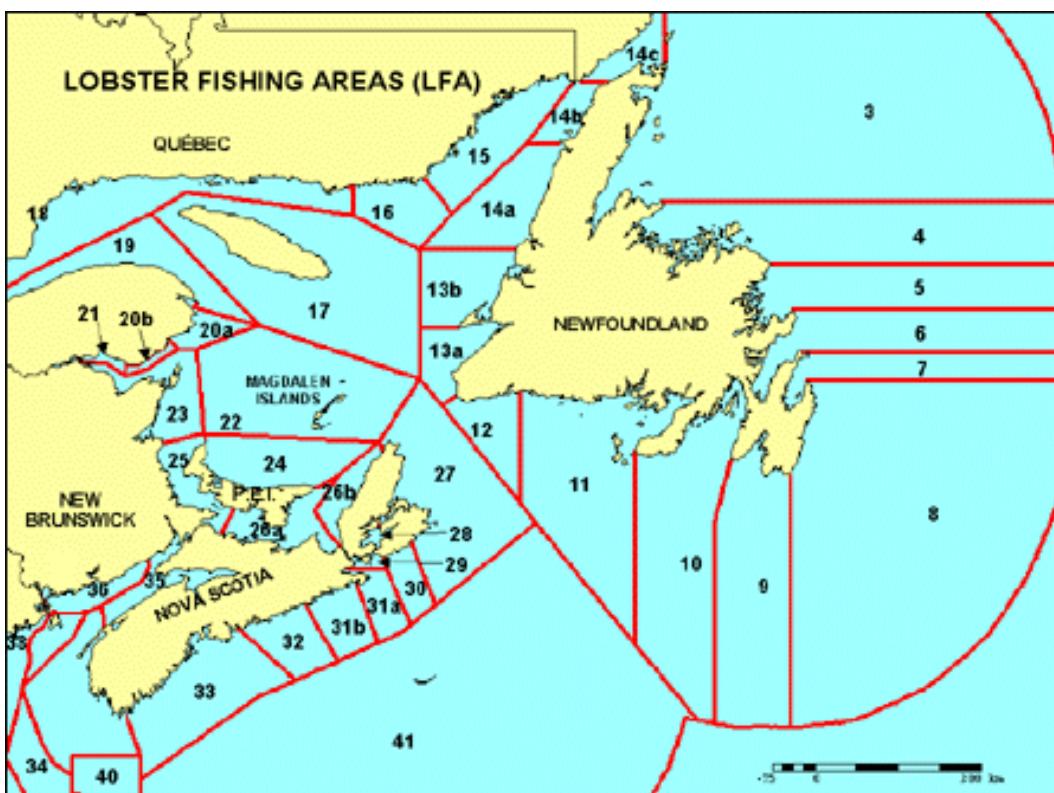


Figure 110. Lobster Fishing Areas (LFA).

Atlantic minke whale is not listed under the SARA and is considered not at risk under the COSEWIC¹²⁹. Sperm whale is not listed either under SARA or the COSEWIC¹³⁰.

The Bowhead whales do not inhabit in the area of the lobster fisheries. They have a nearly circumpolar distribution in the northern hemisphere. There are 4 bowhead whale populations in the world, and 2 occur in Canada: the Bering-Chukchi-Beaufort Sea population (special concern under SARA) (Figure 2) and the Eastern Arctic-West Greenland population (under consideration under SARA) (Figure 3).

¹²⁹ http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=894

¹³⁰ <http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm>



Figure 111. Bowhead whale Bering-Chukchi-Beaufort Sea population. Source: <http://www.dfo-mpo.gc.ca/species-especies/species-especies/bowheadwhale-baleineboreale1-eng.htm>.

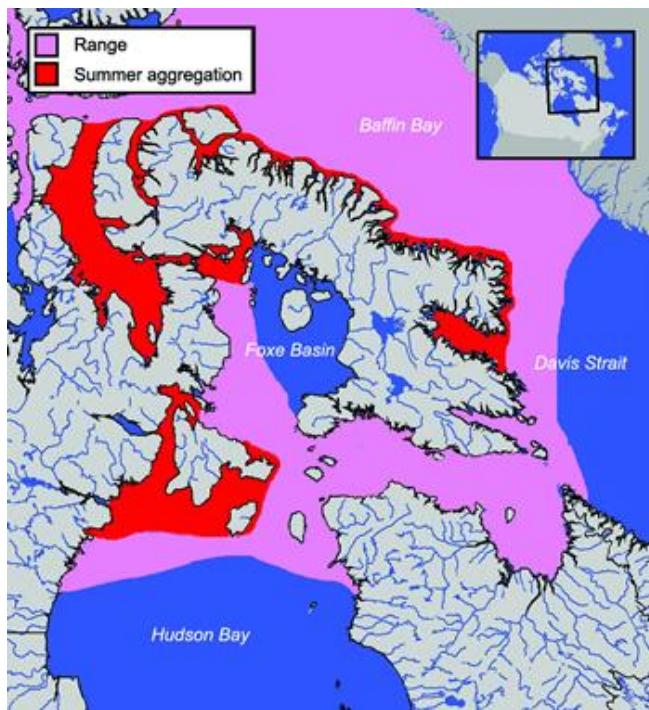


Figure 112. Bowhead whale Eastern Canada-West Greenland population. Source: <http://www.dfo-mpo.gc.ca/species-especies/species-especies/bowheadwhale-baleineboreale2-eng.htm>.

The Scotian Shelf population of the Northern bottlenose whale is listed as endangered under SARA and listed under Appendix I of CITES. However, this population does not inhabit in the area of the lobster fisheries. The Scotian Shelf population lives in relatively small deep waters areas at the entrance to prominent underwater canyons (such the Gully) off the southeast coast of Nova Scotia,

and rarely inhabit waters less than 800 m deep¹³¹. This is also the case of the Sowerby's beaked whale, listed as special concern under *SARA*, which is most often sighted in deep water, along the continental shelf edge and slope, and are only rarely seen in coastal waters¹³².

"Finding that no fisheries incidents involving ETP species have occurred is incorrect"

There have been numerous documented incidents involving marine mammals as well as leatherback sea turtles being entangled in Canadian inshore lobster fishing gear. Data does not appear to have been adequately gathered on this issue, despite it being provided by response networks to DFO as per permit requirements and DFO's participation in response operations. Based on the PCDR, only *SARA* logbooks seem to have been reviewed for these data. As there have been many reports of incidents involving ETP species throughout the certification areas but no records in *SARA* logbooks, they clearly are not sufficient for the evaluation of this threat.

As well, the completion of *SARA* logbooks is only required for *SARA*-listed species. As such, they would not include information on the many other CITES listed species, specifically cetaceans. We strongly recommend that the assessment of this threat be re-evaluated considering all available information. The assessment body should contact the Marine Animal Response Society and the Canadian Sea Turtle Network as well as the DFO Marine Mammal Advisors for data on these issues."

The assessment team acknowledges that data on interactions with ETP marine mammal species have not been adequately gathered. Additional data from the Marine Mammal Response Program have been requested to DFO. We have amended the report using these data and information provided by Warning et al 2014¹³³ and PI 2.3.1. ETP Species Outcome has been re-evaluated. Please note that it was confirmed to the assessment team that no leatherback turtle catches in lobster trap have been reported in the last 5 years in either of the UoCs currently under assessment.

Information from the Marine Mammal Response Program from 2011-2014

In Gulf Region (UoC 1): in 2011, one unidentified whale species was reported entangled in lobster traps and was successfully released alive. In 2012, one Atlantic minke whale, which is not listed under the *SARA* and is considered not at risk under the COSEWIC, was found dead entangled in a lobster trap.

In the Maritimes Region (UoCs 2, 3, 4): one humpback whale, whose Western North Atlantic population is listed as special concern under *SARA*, was reported entangled in lobster trap and successfully released alive. Two Atlantic minke whales, which are not listed under the *SARA* and are considered not at risk under the COSEWIC, were entangled in lobster trap, one died and the fate of the other was unknown.

Information from Warning et al 2014

North Atlantic right whale

¹³¹ <http://www.dfo-mpo.gc.ca/species-especies/species-especies/northernbottlenosewhale-baleinebeccommun-eng.htm>

¹³² http://www.dfo-mpo.gc.ca/species-especies/species-especies/beaked_whale-baleine_bec-eng.htm

¹³³ Waring G.T., E. Josephson, K. Maze-Foley, and P. E. Rosel Ed. 2014. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment – 2013. NOAA Technical Memorandum NMFS-NE-228.

http://www.nmfs.noaa.gov/pr/sars/pdf/ao2013_tm228.pdf

From 2007 through 2011, 17 of 21 records of mortality or serious injury, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 17 records, 4 were located in Canada (Table 1).

Table 78. Entanglement of North Atlantic right whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
8/9/09	Serious injury	Bay of Fundy, XC	None present
8/12/10	Mortality	Digby Neck Nova Scotia, XC	None present
9/3/11	Serious injury	Gaspe Bay, XC	None present
9/27/11	Unknown	Grand Manan Island, Bay of Fundy, XC	None recovered/received

Among these 4 records, gear type was either unknown, or not recorded or not recovered. One record was in Gaspe which is not part of any of the UoCs under the current assessment. All records occurred in August and September when lobster fishing seasons are closed except in the LFA 25 (Southern Gulf of St Lawrence) where the lobster finings season lasts from mid-August to mid-October, and in LFA 38B (Grey Zone) where the fishing season if from June 30 to 2nd Tuesday of November.

Examination of the minimum number alive population index calculated from the individual sightings database, as it existed on 21 October 2011, for the years 1990-2010 suggests a positive and slowly accelerating trend in population size. These data reveal a significant increase in the number of catalogued whales with a geometric mean growth rate for the period of 2.8%.

Humpback whale

From 2007 through 2011, 53 of 63 records of dead or injured humpback whale, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 53 records, 7 were located in Canada (Table 2).

Table 79. Entanglement of humpback whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
9/20/08	Unknown	Brier Island Nova Scotia, XC	None recovered/received
11/8/08	Unknown	Nova Scotia, XC	None recovered/received
9/12/09	Unknown	White Island Nova Scotia, XC	Weir
9/16/09	Unknown	Outside Halifax Harbor, XC	None recovered/received
9/10/10	Unknown	Grand Manan Bay of Fundy, XC	None recovered/received
11/27/10	Mortality	Bay of Fundy, XC	None recovered/received
10/10/11	Serious injury	Grand Manan Bay of Fundy	None recovered/received

Among these 7 records, the gear involved (weir) has been identified in only one case. 4 records were in September when lobster fishing seasons along the Scotian Shelf and Bay of Fundy are closed, except in LFA38B. One record in Bay of Fundy was in October when the lobster fishing season is closed except in LFA 35 and LFA 38B. 2 records were in November when the lobster fishing season is closed along the Scotian Shelf and open in the Bay of Fundy.

The most recent available data suggest that the Gulf of Maine humpback whale stock is characterized by a positive trend in size. This is consistent with an estimated average trend of 3.1% (SE=0.005) in the North Atlantic population overall for the period 1979-1993, although there are no feeding area-specific estimates.

Fin whale

From 2007 through 2011, 13 of 20 records of dead or injured fin whale, including records from both U.S. and Canada waters, involved entanglement or fisheries interactions. Among these 13 records, 4 were located in Canada (Table 3).

Table 80. Entanglement of fin whale 2007-2011. XC=unassigned 1st sight in Canada.

Date	Fate	Location and Country	Gear type
9/9/09	Unknown	Between Campobello and Wolves Island, Bay of Fundy, XC	None recovered/received
10/9/09	Unknown	Long Island Nova Scotia, XC	Gear unidentifiable
7/2/11	Serious injury	Between Anticosti Island and North Shore, Gulf of St Lawrence, Canada	None recovered/received
7/24/11	Mortality	Cheticamp Nova Scotia, Canada	None present

For all these 4 records in Canadian waters, the fishing gear was none present/recovered or unidentifiable. The record in the Bay of Fundy occurred in September when the lobster fishing season is closed except in LFA38B. The record in Long Island occurred in October when the lobster fishing season is closed in LFA 34. Anticosti Island and the North Shore are located in the North part of the Gulf of St Lawrence which is not part of the current assessment. The record in Cheticamp occurred in July when the lobster fishing season is closed in all LFAs of the Southern Gulf of St Lawrence and in most LFAs of the Scotian Shelf (except LFAs 27 and 30 where the fishing season ends mid-July).

A trend analysis has not been conducted for this stock as the statistical power to detect a trend in abundance for this stock is poor due to the relatively imprecise abundance estimates and long survey interval.

Conclusion

Based on the current and additional information provided, the assessment team re-evaluated that it is highly likely that the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries do not pose a risk of serious or irreversible harm to ETP species and do not hinder recovery of ETP species. The score of PI 2.3.1 has been re-evaluated and revised to 85.

“Related to this, there needs to be proper reporting of incidents and examination of carcasses and gear removed from entangled whales. This currently is not the case for all cetaceans and sea turtles. While there is a lot of effort done by local NGOs and partners, including DFO, response is often patchy and incomplete due to inaccessibility of animals or lack of funding.

Despite this, we do know that these animals get caught in lobster fishing gear. As well, there have been even more incidents of animals reported or examined where the gear involved is standard polypropylene green float rope used by many fisheries, including inshore lobster (e.g. see Johnson *et al.* 2005 Marine Mammal Science). Thus, the impact of this fishery cannot be considered to be insignificant. Without identifying the gear or implementing a mandatory gear marking program, the lobster fishery cannot be ruled out of these incidents.”

Under licence condition, lobster harvesters are required to provide information in the SARA Monitoring Document on all interaction with Species at risk while conducting fishing operations. We acknowledge the fact that the identification of the gear involved in mortality or injury of ETP marine mammal species is not possible in most of the cases (Table 1-3). The assessment team re-evaluated the impact of lobster fisheries on ETP marine mammal species and concluded that it cannot be considered insignificant.

“The overall conclusion of the evaluation of PII impacts related to this issue is that there is sufficient data available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. This conclusion is incorrect as there is no systematic collection of data on this threat to marine mammals and sea turtles (no observer data nor adequate completion of SARA logbooks). The Assessment Team also acknowledged that “*It is likely that unreported encounters with ETP species could occur and that the potential exists for this fishery to have some negative impact on the larger ETP species found in the fishery areas*”. However, this uncertainty was not reflected in the scoring of this guidepost. Clearly there are very significant discrepancies.”

This comment is related to the score assigned to PI 2.3.3 ETP Species Information. The assessment team acknowledged that in the absence of observer coverage to verify the information reported by lobster harvesters, unreported interactions with marine mammals or sea turtles could occur. There are no discrepancies in the scoring assigned, 80, as it reflects this uncertainty. Please note that “high degree of certainty”, and “accurate and verifiable information” are required at SG100 not at SG80.

“Claim that seasons do not often overlap with the times of known whale concentrations, and therefore no risk of fisheries interactions, is incorrect”

While there is some seasonality in their distribution, all of the ETP species which should have been considered in this assessment are found throughout the areas being considered for certification. For some species, such as minke whales, they are found year-round in Eastern Canadian waters and therefore, there is potential for interactions throughout the entire fishing season (interactions involving this species have been well documented for this fishery). Thus, the assumption that seasonality of fisheries or whale distribution would result in low or no potential for interactions is incorrect.”

Clarification has been provided above on the definition of ETP species according to the MSC Certification Requirements. The assessment team did appropriately consider all ETP cetacean species which occur in the areas and coincide with the timing of the lobster fisheries accordingly. Atlantic minke whale is not considered as an ETP species, this species is not listed under the SARA and is considered not at risk under the COSEWIC.

The North Atlantic right whale population is located in the Southern (Florida, Georgia), winter portion of the range (DFO 2007)¹³⁴. Late winter and spring feeding aggregations of right whales are observed in Cape Cod Bay Massachusetts Bay and the Great South Channel. Then from June through October as many as two-thirds of the North Atlantic right whale population migrate to feeding grounds in New England waters and Canadian Bay of Fundy, Scotian Shelf, and Gulf of St Lawrence (Waring et al 2014⁷). In Canadian waters, concentrations of foraging right whales are seen in the Bay of Fundy and Roseway Basin (southwestern Scotian Shelf), which are the right whale Conservation Zones), during the summer and early autumn (DFO 2007).

¹³⁴ DFO 2007. Recovery potential assessment for Right whale (Western North Atlantic population). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/027.

Similarly, blue whales undertake long seasonal migrations, south to north, from their wintering areas in equatorial latitudes to summer feeding areas located in productive waters of temperate to subarctic latitudes (Beauchamp et al 2009¹³⁵).

In the western North Atlantic, humpback whales feed during spring, summer, and fall over a geographical area encompassing the eastern coast of the U.S., including the Gulf of Maine, the Gulf of St Lawrence, Newfoundland/Labrador and western Greenland (Waring et al 2014).

Lobster fishing season are shown below:

Table 81. Lobster fishing season in the Southern Gulf of St Lawrence that were in effect in 2012.

LFA and sub-area									
23				25	26A		26B		
23A	23B	23C	23D		26A1	26A2	26A3	North	South
April 28 to June 28		Aug. 13 to Oct. 14		May 1 to June 30		May 2 to June 30		May 1 to June 30	

Table 82. Lobster fishing season in the eastern Scotian shelf as of 2010.

LFA 27	LFA 28	LFA 29	LFA 30	LFA 31A	LFA 31B	LFA 32	LFA 33
May 15 to July 15	April 30 to June 30	April 30 to June 30	May 20 to July 20	April 29 to June 30	April 19 to June 20	April 19 to June 20	Last Monday Nov. to May 31

Lobster fishing season in LFA 34 lasts from last Monday in November to May 31.

Table 83. Lobster fishing season in the Bay of Fundy.

LFA 35	LFA 36	LFA 38
Oct 14 to Dec 31 ; Feb 28 to July 31	2 nd Tuesday in Nov to Jan 14; Mar 31 to June 29	2 nd Tuesday in Nov to June 29 LFA 38B (Grey Zone): June 30 to 2 nd Tuesday Nov

Johnson et al (2007)¹³⁶ show that the groundfish gillnet and groundfish hook and line fisheries likely pose the greatest risk for right whale entanglements. These fisheries made up the bulk of fishing effort in Scotia-Fundy between the months of June and October when the highest densities of right whales occur, and sets were widely distributed throughout the region. Also there was no indication of potential overlap of right whale and lobster trap gear in the vicinity of either whale Conservation Zone.

Thus, the assumption that seasonality of lobster fisheries or whale distribution would result in low potential for interactions is a valid point.

“There are also two issues with the evaluation presented in the PCDR specifically in regards to endangered right whales. First, while for some LFAs in the Bay of Fundy the fishing season does not overlap with the primary months right whales are present (June-October), for others, including the Grey Zone and in the Gulf of St. Lawrence, the fishing season directly overlaps with the primary occurrence of right whales (see Figure 1 below for locations of observations of right whales in the Gulf of St. Lawrence). Recently, DFO-Maritimes implemented a poster

¹³⁵ Beauchamp, J., Bouchard, H., de Margerie, P., Otis, N., Savaria, J.-Y., 2009. Recovery Strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. 62 pp.

¹³⁶ Johnson, T.T., Smedbol, R.K., Serdynska, A., Vanderlaan, A., Helcl, N. Harris, L., and Taggart, C.T. 2007. Patterns of fishing gears in areas of the Bay of Fundy and southwest Scotian Shelf frequented by North Atlantic right whales. Can. Tech. Rep. Fish. Aquat. Sci. 2745: v + 52 p.

campaign requesting right whale sightings and as a result, there has been a significant increase in the reporting of right whales throughout their Eastern Canadian range, particularly in the Gulf of St. Lawrence. We recommend the assessment body contacts Lei Harris for more information. As well, through passive acoustic monitoring by Scientists with DFO-Quebec, the presence of right whales in the Gaspé and Baie des Chaleurs Basins has been confirmed and indications are that the whale regularly frequents the Gulf of St. Lawrence at the end of summer and into the fall (DFO unpublished data). Thus, all indications are that this species does overlap with the lobster fishing seasons in several of the certification areas. Secondly, it has also been well documented that right whales have been observed in Canadian waters prior to June and after October, often overlapping with the lobster fishing season in several areas, including their core Critical Habitat. These data are available from multiple sources, including DFO.”

Although the assessment team acknowledges the lobster fishing season in the Grey Zone, LFA 38B, lasts from June to November and therefore overlaps with months right whale are present in the Bay of Fundy, both Canadian and U.S lobster harvesters fish in this Zone, U.S. harvesters fishing year-round. All the LFA 38 lobster licence holders (136 licences) are eligible to fish in the Grey Zone, but the average number of Canadian fishing boats operating in the Grey Zone has been closer to 20-25 each summer (DFO Maritimes, *pers. comm.*, April 2015). Also evidence based on information from the grid based logbooks introduced in 2003 indicates that an important component of the Bay of Fundy lobster fleet moves offshore during summer months and there is no overlap evident in the available data between lobster gear and regional coastal waters frequented by right whales (Johnson et al 2007).

Regarding the Gulf of St Lawrence, Figure 1 (on the following page) which you provided in your letter suggests to the assessment team that there is low or no overlap between the presence of right whale and the Southern Gulf of St Lawrence lobster trap fishery (LFAs 23, 25, 26A and 26B). As you mentioned, Figure 1 shows that the highest concentration of right whale occurs in Gaspé Peninsula which is not part of the UoCs currently under assessment. Also, Baie des Chaleurs is shared between Gaspésie and New Brunswick (LFA 23), and the LFA 23 lobster fishery is a spring fishery lasting from April to June (Table 4). Figure 1 below shows sighting of one right whale in the Northumberland Detroit (LFA 25) and one right whale in the north side of Prince Edward Island (LFA 24) which is not part of the Southern Gulf of St Lawrence UoC.

There is no lobster fishing activities in the Southern Gulf of St Lawrence at the end of the summer and into the fall, except in LFA 25 (Table 4).

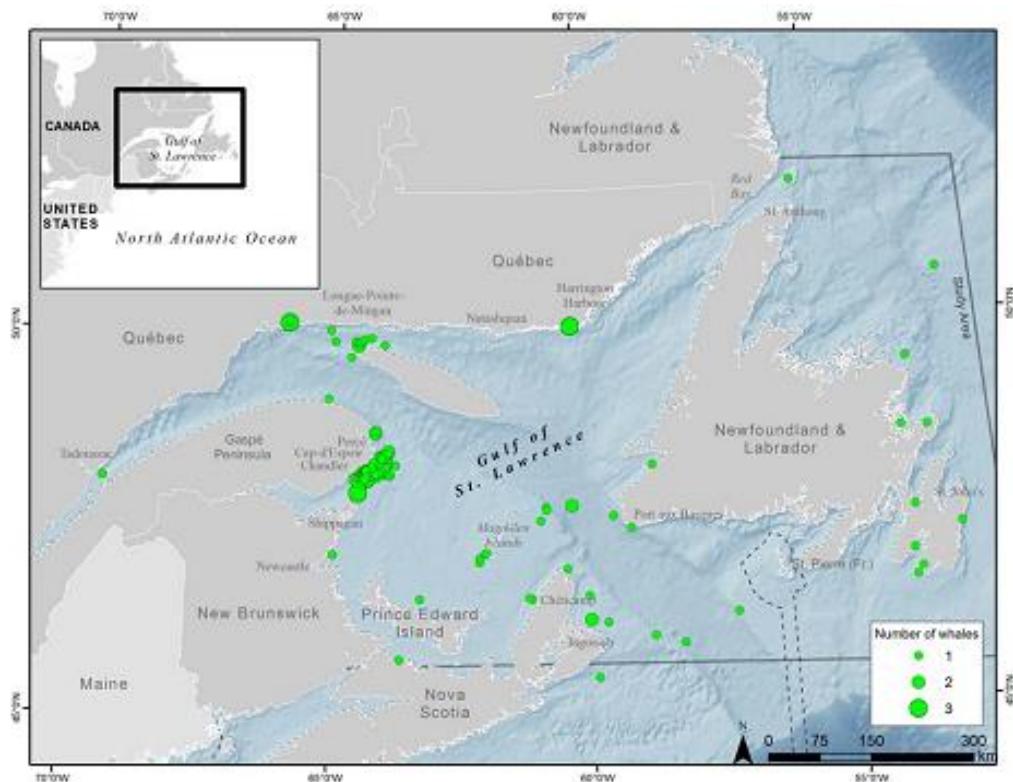


Figure 1. Sightings of North Atlantic right whales in the Gulf of St. Lawrence from 1951-2013 (North Atlantic Right Whale Consortium unpublished data; Not for use without permission).

Regarding the second point raised, the assessment team acknowledges that right whales have been observed in Canadian waters after October. There have been sightings of right whales in Bay of Fundy as late as December, and right whale vocalizations have been detected on Roseway Basin as late as December (DFO 2007). However, this appears not to be a general trend.

“Additional comments regarding the Evaluation of PII impacts on ETP species

The suggestion that because recovery strategies for some of these ETP species have been developed does not mean there has been any formal implementation of strategies or action plans to reduce or mitigate threats to these species from these fisheries. To date, these Action Plans have not been completed and there has been no formal implementation of any measures to reduce interactions of this fishery with marine mammals or sea turtles.

The voluntary measures which have been implemented by LFAs 33-34 as well as the strategy implemented by LFAs 36-38 (not cited in the PCDR; available at: <http://gmfa.nb.ca/wpcontent/uploads/2012/09/Right-Whale-Mitigation-Strategy-2013.pdf>) are a good start to better understand the threat to right whales and do aim to reduce interactions, but these are just voluntary (i.e. not required) and there's been no effort to ensure or measure compliance. Hence, these cannot be used to formally quantify any reduction to risk nor be used to support the statement that there *is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species* or the resulting score of 100 (nor even >80).”

The voluntary measures implemented in LFAs 33 and 34 and a Fundy North Fishermen's Association project to reduce threats to marine mammals have been mentioned in the PCDR (p. 152 and in PI 2.3.2 scoring table). However, the Mitigation Strategy 2013-2014 implemented by LFAs 36-38 has been initially not mentioned in the PCDR, and has been now included.

The assessment team acknowledges it cannot be considered there is a comprehensive strategy in place for managing the lobster fisheries impacts on ETP species, and has re-evaluated the PI 2.3.2 by downgrading the score from 95 to 80. The assessment team considers that there is a strategy in place to minimize impact of lobster fisheries on ETP species: the reporting of interactions with ETP species is mandatory, recovery strategies are proposed, the seasonality of all lobster fisheries, limited numbers of licences and traps, the requirement of a minimum of 6 traps per trap line in LFA 26A and fishing practices in place in LFAs 25 (traps set per lines even if not required) reduces the total number of buoy lines in the water column thereby reducing the number of possible interactions with marine mammals and sea turtles, and voluntary industry projects in LFA 33, 34 and the Bay of Fundy have been implemented to minimize mortality of marine mammals.

"In several instances, there is mention that training courses in release techniques have been provided to license holders (e.g. p335, PII 2.3.2). This is not the case for the lobster fishery (nor any other fisheries except in relation to the release of leatherback sea turtles in the pelagic longline fishery). We are unaware of any voluntary or mandatory marine animal release training programs."

The assessment team apologizes for the confusion as the training courses in release techniques mentioned refer to wolfish species not marine mammal and sea turtles. The report was amended to avoid the confusion.

"Information included in the PCDR on the North Atlantic right whale population is out-of-date. The population estimate is incorrect. While there has been no change in the status of the species, as of 2014, the population is estimated to be over 450 individuals. As well, there is no mention of their significant use of the Gulf of St. Lawrence. Right whales, particularly moms and calves, have been documented consistently in the waters off the Gaspé Peninsula and Western Cape Breton Island (see Figure 1 below). This information is available from DFO, as are the passive acoustic monitoring information mentioned above, and it's not clear why it was not considered in this assessment."

The information on population has been amended and now mentions a minimum population size of 455 individuals (Waring et al 2014).

Although, the assessment team acknowledges the use of the Gulf of St Lawrence, the Gaspé Peninsula where the highest concentration of right whale occurs is not part of the Southern Gulf of St Lawrence UoC currently under assessment. Figure 1 shows sighting of 2 or 3 right whales in 62 years (1951-2013) in Western Cape Breton, which cannot be qualified as significant. Moreover, the lobster fishing season in Western Cape Breton, LFA 26B, lasts from May to June.

As a result of the above issues, we highly recommend a re-evaluation of this issue following discussions with SARA division of DFO regarding at risk cetaceans and sea turtles and the examination of the actual data available on incidents with the inshore lobster fishery (available from local response networks as well as DFO).

The assessment team has considered additional information and has re-evaluated Pls 2.3.1 ETP Species Outcome and 2.3.2 ETP Species Management Strategy for all UoCs. The score for PI 2.3.1 and 2.3.2 was revised to 85 and 80, respectively.

“Comments regarding consideration of the impacts to sensitive habitats

While Ecologically and Biologically Sensitive Areas (EBSAs) have been discussed, no explanation of how or if they were taken into consideration in assessing the impacts of the fishery on each of the ecological and biological components of the respective EBSAs where the fisheries take place could be found.”

The assessment team has evaluated impacts of lobster fisheries on components of the ecosystem (target, retained, bycatch, ETP species, and habitat) as well as impacts on the wider structure and function of the Southern Gulf of St Lawrence, Scotian Shelf and Bay of Fundy Ecosystem where the EBSAs are found.

“As well, the Assessment Team should review DFO’s Science Response document 2014/044, which identifies potential sensitive benthic areas in the Bay of Fundy (Head Harbour/West Isles/Passages; Modiolus Reefs). Even though the Sensitive Benthic Policy and Risk Assessment Framework has been mentioned in the draft PCDR, it would be valuable to include information about how potential impacts from these fisheries (and potential ghost fishing from other areas) in these areas is being prevented. In addition, it is not clear how potential impacts from the fisheries or ghost fishing is being avoided for the sites identified by Kenchington et al (2010; CSAS Research Document 2010/041 on the delineation of coral and sponge concentrations in East Canada using spatial analysis). The paper is cited, however, there is no discussion or figure of the overlap of the actual fishing effort with those Vulnerable Marine Ecosystems. We would highly recommended that this evaluation is conducted.”

Lobster fisheries management limits habitat impacts by restricting the number of licences, the number and size of traps, and the fishing season. Traps are not soaked on the first day of the fishing season if winds are too strong, reducing crushing and scouring effects resulting from traps being dragged across the bottom during a period of bad weather. The footprint has been evaluated for LFAs 35-38, and as a result the area affected by traps in any given year in LFAs 35-38 is calculated to be less than 0.05% of the total area. Potential impact of lobster fishery on the Head Harbour/West Isles/Passages is prevented by the ghost and marine debris removals conducted in LFA 36 in summer and fall by the Fundy North Fishermen’s Association.

Figures 94, 95, 96, 97 from Kenchington et al show that coral and sponge concentrations do not overlap with the lobster inshore fishing grounds.

“Comments on Certification Recommendations and Conditions

The bycatch of ETP marine mammals and sea turtles is a national and international concern, particularly for SARA-listed species. Bycatch is one of the main reasons this fishery has been identified as “one to avoid or be highly concerned about” by several seafood choice guides. This is an issue that is very concerning to the conservation community as well as the general public when they are making seafood purchasing choices.”

Although the assessment team could not find seafood choice guides identifying the Canadian lobster fisheries as “one to avoid”¹³⁷, the current assessment is undertaken against the MSC Principle and Criteria for Sustainable Fishing which include Principle 2’s focus on the Ecosystem impacts.

“As evidenced above, the Assessment Team did not do an adequate job assessing the impacts

¹³⁷ <http://www.seafoodwatch.org/seafood-recommendations/detail/115615281/lobster-american-trap-canada-homarus-americanus?type=american&q=Lobster,%20American>; <http://seafood.edf.org/lobster;> <http://safinacenter.org/seafoods/?seafood-search=lobster&x=0&y=0>

of these fisheries on ETP species. Given the evidence available (but not considered) and the uncertainty, there should be a Condition related to the requirement of the collection of these data and the mitigation of impacts. This is required by law for many of these species under SARA. We strongly recommend a re-evaluation of the impacts on ETP species considering all available data and that a Condition is set to address this issue.”

The assessment team acknowledges that data on interactions with ETP marine mammal species have not been adequately considered. Based on further analysis of information, the score of PIs 2.3.1 and 2.3.2 has been revised to 85 and 80, which does not require that a Condition be set.

“Overall conclusions

The assessment team did not adequately consider the impacts of these fisheries to ETP species. Given the above mentioned issues, we do not agree with the (primarily) SG100 scoring of PII related to ETP species and the general conclusions that *there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection* and that *there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species*. In order to achieve a score of SG80 or 100 for this performance indicator through qualitative assessment, MSC requires that the risk to be *very low*. Enough data and uncertainties exist with regards to the impacts to ETP cetaceans and sea turtles that the risk cannot be considered *very low*. We believe that the information that currently exists for cetaceans is insufficient to justify the given overall scores of >SG80. As many of these ETP species are considered to be at risk or extremely vulnerable to fishing interactions, a precautionary approach must be considered. This is particularly important given the paucity of data regarding impacts to all of these species from this fishery (i.e. no observer coverage, poor or no SARA reporting, inaccurate consideration of other sources of data). As scientific information is unable to indicate whether or not this fishery is impacting these species, some of which are considered to be critically endangered, the burden of proof should fall to the fishery to demonstrate that it is “highly unlikely” to create unacceptable impacts to ETP species. Therefore, precautionary measures should be applied to account for this uncertainty until such a time that it is proven otherwise.

For some species, the removal of even a few individuals can have very significant impacts on the whole population and their recovery. The Assessment Team’s finding that there is “*no risk of serious or irreversible harm*” (e.g. as stated on p152 and PII) is very concerning and potentially very damaging to the protection and recovery of these species.”

The assessment team acknowledges that interactions with ETP marine mammal species presented in the PCDR have not been adequately addressed.

In order to achieve as score of 80, MSC does not require *the “risk to be very low”* but that “*It is highly likely that the fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder the recovery of ETP species*”.

First, clarification has been provided on the definition of ETP species according to the MSC Certification Requirements. The assessment team did appropriately consider all ETP cetacean species which occur in the areas and coincide with the timing of the lobster fisheries.

Secondly, based on the current and additional information provided on the interaction of lobster fisheries with ETP marine mammals, the score of PI 2.3.1 has been re-evaluated and revised to 85. Moreover, the assessment team is satisfied it has been fully demonstrated that the assumption that seasonality of lobster fisheries or whale distribution would result in low potential for interactions is both valid and convincing.

Third, the assessment team acknowledges while there is not a comprehensive strategy in place for managing the lobster fisheries impacts on ETP species, it nonetheless considered that a strategy in

place to minimize impact of lobster fisheries on ETP species. Therefore, the PI 2.3.2 score was revised to 80.

Updated scores reflect associated uncertainty and the assessment team concludes that it is highly likely the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries do not pose a risk of serious or irreversible harm to ETP species and do not hinder recovery of ETP species.

Thank you, once again, for bringing concerns and suggestions to the attention of the assessment team.

Yours sincerely,

Géraldine Criquet

Fisheries Assessment Officer

Assurance Services - EMEA

SAI Global Assurance Services Ltd / Global Trust Certification Ltd

3rd Floor, Block 3, Quayside Business Park

Mill Street

Dundalk, Co, Louth

Ireland

Phone: +353 (0) 42 932 0912

Mobile: +353 (0) 86 411 0951

Fax: +353 (0) 42 938 6864

Web: www.saiglobal.com/assurance

www.gtcert.com

MSC's comments and Assessment team's responses



Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom
Tel: +44 (0)20 7246 8900
Fax: +44 (0)20 7246 8901

Date: 25/02/2015

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	Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster Trap
Document Reviewed	Public Comment Draft Report

Ref	Type	Page	Requirement	Reference	Details	PI
11223	Major	284, 286	CR-27.10.5.2 v.1.3	27.10.5 The team shall score individual PIs. 27.10.5.2 If all of the SG60 scoring issues are met, the PI must achieve at least a 60 score and the team shall assess each of the scoring issues at the SG80 level. If not all of the SG80 scoring issues are met the PI shall be given an intermediate score (65, 70 or 75) reflecting overall performance against the different SG80 scoring issues. Award 70 where performance against the scoring issues is mid-way between SG60 and SG80 (some scoring issues are fully met and some are not fully met); and. Award 75 when performance against the scoring issues is almost at SG80 (most scoring issues are fully met but a few are not fully met); and. Award 65 when performance against the	Two out of three relevant scoring issues are not met, but the report gives a score of 70. CR 27.10.5.2 (iii) requires the team to award 65 when performance against the scoring issues is slightly above SG60 (a few scoring issues are fully met but most are not fully met).	1.2.2

scoring issues is slightly above SG60 (a few scoring issues are fully met but most are not fully met).
 b. If any one or more of the SG80 scoring issues is not met, the PI shall be assigned a condition (or conditions).

Assessment team's response

The score of PI 1.2.2 was revised to 65 to comply with CR 27.10.5.2(iii).

11224	Major	386-397	CC2.3.2.1 v.1.3	<p>The team shall work with stakeholders at the SICA consultation meeting(s) to assign a spatial scale score.</p> <p>a. The greatest spatial extent shall be used to determine the spatial scale score for the activities relevant to the scoring elements within the PI under consideration (Table CC8).</p> <ul style="list-style-type: none"> i. For Principle 1, this is determined based on the percentage of the total range of the stock that overlaps with all fishing activity affecting the stock. ii. For Principle 2, only overlap of the stock, habitat, or ecosystem with the fishing activity of the unit of certification shall be considered. <p>b. The score shall be recorded onto the SICA</p>	<p>CC2.3.2.1 requires the team to determine the spatial scale of the activity (RBF/SICA) based on the percentage of the total range of the stock that overlaps with all fishing activity affecting the stock. In PI 1.1.1, the team has scored spatial scale of the activity as 3 (16-30% overlap for UoC 1) and 4 (31-45% overlap for UoCs 2,3 and 4). Although some general rationale has been provided, the report is unclear on how these percentages have been calculated or what sources of information have been used to make those calculations.</p>	1.1.1
-------	-------	---------	-----------------	--	--	-------

Assessment team's response

The score of the spatial scale of activity was determined as 3 for both UoC 1 and UoC 2, and as 4 for both UoC 3 and UoC 4, using stakeholders' knowledge and documented data. The percentages have been calculated using information on the fishery footprint provided in DFO 2013b for UoC 1, DFO 2011b for UoC 2, DFO 2013d for UoC 3 and DFO 2013e for UoC 4. The area of attraction of bait was evaluated by Watson et al 2009.

Please note that all these documents are referenced in the PI 1.1.1 scoring table for each UoC.

11226	Major	388-399	CR-CC2.3.6.8 v.1.3	The team may amend a converted MSC score within a scoring guidepost category's 20-point range if there is any additional relevant information available which justifies an amendment.	The team considered the consequence of fishing on the lobster reproductive capacity as moderate, which leads to a score of 2 with a MSC equivalent score of 80. The team also saw appropriate to award an amended score of 90 based on CC2.3.6.8. Although the information provided seems to be relevant and appropriate for supporting the initial consequence score (2 = MSC 80 score = "possible detectable change in reproductive capacity but minimal impact on population dynamics"), the report is unclear on how this could be considered as a "additional information" supporting a higher score. In order to award a higher MSC score (e.g. 90), the report should provide additional and relevant information supporting, to some extent, what is required in Table CC11 for achieving a lower consequence score (1 = MSC 100 score): "No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population".	1.1.1
-------	-------	---------	--------------------	---	---	-------

Assessment team' response

As per CC2.3.6.8, the team adjusted the MSC score as we felt a higher score, 90 but not 100, was warranted. The rational provided strongly supports this adjustment of the score. Although there is a possible detectable change in the reproductive capacity, it was shown that the reproductive capacity has increased over the time and that the impact on the population dynamic is positive. This is a result of the management measures, including an increase of the minimum legal size, the mandatory release of window-size female, and the reduction in fishing effort, put in place with the objectives of increasing egg production.

12216	Minor	15, 232-233	CR-CI3.1 v.1.3	CABs assessing overlapping fisheries shall ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments.	<p>Two UoCs from the already certified PEI lobster fishery are a direct overlap with one UoC in this fishery, but the harmonisation summary does not include reference to both of those PEI UoCs. Further, Section 5 does not include a discussion of SWNS, Bay of Fundy or Gulf of Maine. The report also does not discuss whether UoCs 3 and 4 have overlap, has stock sharing, or need to be harmonised with the offshore certificate (LFA 41) or with the Maine certificate.</p> <p>Additionally, the team concluded that each of the UoCs is a distinct biological unit based on information provided in section 4.2. However, the degree of connectivity and therefore the basis for consideration as independent biological units between LFA 34 (UoC 3) / LFAs 35-38 (UoC 4) and the Maine lobster fisheries (U.S.) or between these LFAs and the already certified Eastern Canada offshore lobster (LFA 41) is unclear within the report.</p>	
-------	-------	-------------	----------------	--	--	--

Assessment team's response

The already certified PEI lobster fishery is defined according to a single UoC, not 2. Please see p. 8 and 13 of the PCR published November 6th 2014:
http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/prince-edward-island-lobster-trap/assessment-downloads-1/20141106_PCR_LOB415.pdf

A discussion including Bay of Fundy and WS Scotian Shelf was included in Section 5.1. Also a clarification is provided on the distinct biological units between Maritimes UoCs and the already certified LFA 41 and Maine lobster.

12217	Minor	24-42	CR-CF1.2 v.1.3	Fisheries assessment reports shall conform with the template "MSC Full Assessment Reporting Template" found at http://www.msc.org/documents/scheme-documents .	Fisheries assessment reports shall conform with the template "MSC Full Assessment Reporting Template", in which is expected (section 3.2 Overview of the fishery - b) to provide the most recent information on fishing levels). Although the assessment started in 2014, the team used and reported catches and landings from 2011 (or 2010 in some UoCs).	
-------	-------	-------	----------------	--	---	--

Assessment team's response

The assessment team used reported catches data available at the start of the assessment in 2014. The Table 1 at p. 29 was updated with 2012 and 2013 data (preliminary) available in 2015 at <http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-eng.htm>.

12222	Minor	244	CR-27.6.2.3 v.1.3	The CAB shall document the rationale for the target eligibility date and include an assessment regarding how the assessed risks to traceability systems in the fishery are adequately addressed by the applicant to give confidence in this date.	Regardless of the shift in Target Eligibility Date, the report does not describe how sufficient traceability, segregation and identification has been implemented since July 2014 to give confidence that these systems have been in place since then.	
-------	-------	-----	-------------------	---	--	--

Assessment team's response

There is no risk of loss in the traceability, segregation and identification systems. As purchase slips contain the date of purchase and harvester logbooks contain the date of catch, the fishery and trade system can differentiate product from that sold prior to July 2014 and that sold from that date onwards. The target eligibility date is for product sold from the client group from 1st July onwards.

12223	Minor	245	CR-27.12.1.1 v.1.3	<p>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:</p> <p>27.12.1.1 The systems in use.</p>	<p>Referring to the section "Buyer Fish Slips and Weekly Returns", there is no description of the system(s) in place that allow buyers to link the vessel to the unit of certification. Specifically, how buyers will know that the vessel identification provided on the purchase slip is a vessel that is part of one of the units of certification in this fishery. This will safeguard against buyers accidentally selling lobster on as certified (where it comes from a fishery that is already certified e.g. PEI), before Bay of Fundy and Gaspesie are certified.</p>	
-------	-------	-----	--------------------	---	--	--

Assessment team's response

The number of licences is limited in each LFA (Table 10, 11, 12 and 13). The lobster licence is single LFA specific, so the licence holder cannot fish lobster in another LFA than the one he's licenced for. A list of licence holders/vessels name is updated at each lobster fishing season and is available to buyers. Purchases of lobsters must be documented on a purchase slip by the registered buyer containing details of purchases within a week. Information on the purchase slip includes the name of the permit holder, the name of the fishing vessel, the place of landing and the quantity of product per permit holder. Therefore, the system allows buyers to know which LFA so which UoC the fishing vessel/licence holder is part of.

12224	Guidance	247	CR-27.12.2.1 v.1.3	<p>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:</p> <ul style="list-style-type: none"> 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. a. Chain of custody certification shall always be required following a change of ownership of the product to any party not covered by the fishery certificate. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determines 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. c. If the point where chain of custody certification is required is covered by the fishery certificate, the team shall determine the parties or category of parties covered by the fishery certificate that require chain of custody certification. 	<p>An organogram would help to illustrate the complex relationships and movements of lobster between and outside the members of the fishery certificate.</p>	
-------	----------	-----	--------------------	---	--	--

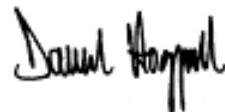
Assessment team's response

The assessment team acknowledges the complexity of the Traceability section and an organization chart was added in Appendix 6. Please note that this chart has also been provided in the PCR for PEI lobster trap fishery.

www.msc.org						
12225	Major	145, 323-324	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	Units 2, 3 and 4 for 2.2.1: Rationale shall be presented to support the team's conclusion. Further, the RBF was used even though very little information/data is available to describe the bycatch for these UoCs. Units 2, 3 and 4 for 2.2.3: Rationale shall be presented to support the team's conclusion. The rational for scoring issue (a) provides limited data (only 41 sampling trips), which also is not recent information (2006); therefore saying that there is some quantitative information is not supported.	2.2.1, 2.2.3

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 Jodi Bostrom on +44 (0)20 7246 8934 for more information.

Best regards,
 Fisheries Oversight Director
 Dan Hoggart
 Marine Stewardship Council



cc: Accreditation Services International

Assessment team's response

RBF wasn't used for scoring PI 2.2.1 for Maritimes UoCs, but only for UoC 1. It's clearly presented in the report.

Please note that following additional information received, the report was amended and the score of PI 2.2.1 was lowered to 80 for Maritimes UoCs. Also, the rational for scoring issue (a) was modified and contains now the following:

As part of their Science Activities which include research and monitoring of lobster in the LFA 27, LFA 27 Management Board conducts at sea-sampling to record incidental catch since 2011 . 27, 38, 45 and 75 at-sea samples were taken during the lobster fishing season in 2011, 2012, 2013 and 2014, respectively.

The Guysborough County Inshore Fishermen's Association has been recording incidental catch (in number) for LFAs 31a and 31b since 2009. The study showed that the mean percentage of all non-lobster species caught in lobster traps was 11%, and 4.3% for LFA 31a and LFA 31b, respectively; and the mean percentage of non-lobster species minus rock crab, green crab and sculpin (that are allowed to be landed by licence conditions) was 9% and 1.3%.

The catch of 41 lobster fishing trips were sampled at-sea between November 2005 and July 2006 in Eastern Scotian Shelf. As a result, more than 90% of the catch, by weight and number, was lobster. None of the bycatch species represented 5% or more than 5% of the lobster catches.

The Maritimes Region lobster fisheries were at-sea sampled as part of the Species at Risk (SARA) bycatch study, for levels of incidental catches during 2009-2010 lobster fishing season. The results showed that the non-lobster portion of the total catch ranges from 1.5% in LFA 31B to 13% in LFA 33. If legally retained crab species are not included, bycatches range from 0.1% (LAF 32) to 7.5% (LFA 33). The conclusion of this study was that the overall incidental catch, with exception of the crab species, was low.

A 2010 special sampling project was undertaken to estimate cusk bycatch in LFA 34 lobster fishery.



Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom
Tel: +44 (0)20 7246 8900
Fax: +44 (0)20 7246 8901

Date: 23/04/2015

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	Bay of Fundy, Scotian Shelf and Southern Gulf of St. Lawrence lobster Trap
Document Reviewed	Final Report Submitted

Ref	Type	Page	Requirement	Reference	Details	PI
13286	Minor	334-336, 343-345	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	UoCs 2, 3, and 4 for PIs 2.2.1 and 2.2.3: As raised in the technical oversight for the PCDR, the rationales for these two PIs still do not speak to UoC 4.	2.2.1, 2.2.3

Assessment team's response

The section 4.4.2.2 and the rational for PIs 2.2.1 and 2.2.3 contain now the following:

Although no SARA sampling was completing for LFAs 35-38 (UoC 4), qualitative and some quantitative information on bycatch is available from at-sea samples (Trembley et al 2013). If legally retained crab species are not included, bycatches are estimated to be approximately 1% of the total catch, and include sculpin, cod, cusk, hermit crab, flounder, and whelk (DFO 2014f, lobster harvesters and DFO during 2014 site visit).

Appendix 4. Surveillance Frequency

The determination of the surveillance level is based on Table C3 and C4. The score was calculated by adding scores from sections 1-4 in table C3.

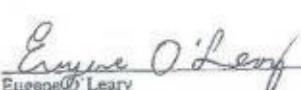
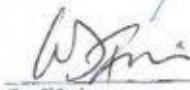
Table C3: Criteria to determine surveillance score

1. Default Assessment tree used?	
Yes	0
No	2
2. Number of conditions	
Zero conditions	0
Between 1-5 conditions	1
More than 5	2
3. Principle Level Scores	
≥ 85	0
< 85	2
4. Conditions on outcome PIs?	
Yes	2
No	0

The surveillance score of **5** was used to identify the surveillance level appropriate to the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster trap fisheries.

Table C4: Surveillance Level Years after certification or recertification					
Surveillance score (from Table C3)	Surveillance level	Year 1	Year 2	Year 3	Year 4
2 or more	Normal Surveillance	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & recertification site visit

Appendix 5. Client Agreement

05/10/2015	17:59	9823982843	EUGENE O'LEARY	PAGE: 01
p 2				
<p>May 20, 2015</p> <p>SAI Global Assurance Service 3rd Floor Block 3 Quayside Business Park Mill Street Dundalk, Co. Louth Ireland</p> <p>To: Geraldine Criquet/Jean Ragg</p> <p>This letter confirms our acceptance of the Public Certification Report for the 'Nova Scotia/New Brunswick Lobster Eco-Certification Society (<i>Honarus americanus</i>) Trap Fishery', Report - MSC 013, dated April 28, 2015.</p> <p>We would like to thank you and the entire team at SAI Global who participated in this project. We look forward to an ongoing relationship as we proudly move forward with this certification.</p> <p>Sincerely,</p> <p> _____ Eugene O'Leary Director</p> <p> _____ Catherine Boyd Director</p> <p> _____ Geoff Irvine Secretary</p>				

Appendix 5.1 Objections Process
No objection has been raised.

Appendix 6. Lobster Distribution Description

**Atlantic Canadian American Lobster Pot Fishery
Lobster Distribution Description
January 8, 2014**

This document is submitted to SAI Global as a guidance document for discussion regarding chain of custody in the Atlantic Canadian lobster industry and consideration for chain of custody requirements in the assessment report. Industry stakeholders have expressed concerns regarding the practicality for all companies at various levels in the supply chain to each hold a Chain of Custody (CoC) certificate. The complexity of the industry makes the current MSC requirements particularly cumbersome, very expensive for an economically challenged sector, and possibly unnecessary in order to meet the MSC CoC standard.

Most of the front-line participants in the industry, specifically small independent buyers are actually buyer agents for the processors and live shippers. The role of these buyers is very limited, normally including unloading, weighing, transportation and provision of bait and supplies. The necessity for these independent buyers, and subcontracted agents, is dictated by the logistical challenges of servicing the ~10,000 harvesting participants, many of whom land small quantities of lobster in remote rural communities. For the most part, these buyers align themselves with one or two processors or live shippers, simply acting as agent on their behalf. This agent role is demonstrated by the fact that many of these independent buyers do not directly pay the harvester; relying on the processor or live shipper to settle accounts and receiving payment for their services based on a commission per pound.

Processors and live shippers, defined as those participants that have the ability to supply product into the market through distributors, retailers, restaurants or consumer, procure supply from numerous suppliers. These include direct buy from harvesters, commissioned supply from independent buyers, transfer sales from live shippers that may have an excess supply or lobster culls (one claws, weaks, etc.), and transfer sales from other producers that have excess supply.

The Canadian Lobster Industry

The Atlantic Canadian lobster fishery is the most valuable fishery in the country accounting for \$1b of export value annually. Lobster is pursued by ~10,000 licensed harvesters, purchased by ~300 buyers and supplied to ~35 plants and more than 100 live shippers. Lobster is sold live, whole frozen, whole cooked, and in various meat product forms. Atlantic Canadian lobster is shipped to all continents and available in all developed and many developing nations.

MSC Certification Efforts

There are five MSC certifications at some stage of assessment, including:

- The Magdalen Island fishery was certified in 2013.
- Prince Edward Island adjacent fisheries are undergoing full assessment.
- Nova Scotia and New Brunswick fisheries will soon be prepared to move forward to full assessment.
- Quebec/Gaspe Lobster fishery – just about to commence
- Newfoundland and Labrador have completed their pre-assessment and have expressed intentions to move forward to full assessment.

The intent of the majority of Canadian Atlantic lobster stakeholders is to have the entire Canadian lobster supply stream certified within the next 18 months.

Chain of Custody

The MSC Chain of Custody (CoC) certification ensures products from MSC certified fisheries are traceable and not co-mingled in the supply chain prior to being packed in a tamper proof container ready for an end user in retail or food service. CoC is required for all companies that buy and sell products from MSC certified fisheries prior to final packaging. The structure of the lobster industry in Atlantic Canada demonstrates significant complexity in ownership and movement of live lobster for export and for local processing.

The CoC program is designed to encompass all types of seafood supply chains. A good understanding of the structure and practices of the Atlantic Canadian lobster industry is needed to ensure MSC CoC is implemented in the most efficient manner possible. The Atlantic Canadian lobster live distribution system is the most complex of all Canadian fisheries due to the number of participants, broad distribution of the resource and the fact that much of the resource is sold to end-buyers and consumers in live form.

There are 41 lobster fishing areas (LFA's) in Atlantic Canada, managed according to a time honoured schedule of season openings to ensure year-round supply of live lobster. There are ~35 processing companies spread throughout the region with a concentration in Gulf of St. Lawrence regions of New Brunswick, Prince Edward Island and Nova Scotia that ship to the export market. There are hundreds of companies that buy, hold and sell live lobster for the domestic or export markets. There are also hundreds of companies that act as buying agents moving lobster from the wharf to these two types of domestic suppliers or exporters. Some of the companies involved do all this activity, whereas some specialize in one aspect.

A significant percentage, mostly 100 percent of the lobster, landed in LFA's under assessment will be MSC certified sometime in the next 2-3 years. This minimizes the opportunity to co-mingle this lobster with non-certified lobster for most independent buyers as they remain geographically limited to one or several adjacent landing ports. Over time, as the five separate certifications are achieved, the entire Atlantic Canadian supply chain will be certified, eliminating the opportunity for co-mingling.

Traceability Systems

All producers and live shippers have the demonstrated ability to execute a product recall, and their tracking system dictates how broad the recall may be. The more detailed the tracking system the narrower the recall requirement, so stakeholders are motivated to continuously improve traceability systems to minimize their product recall risk.

All producers and live shippers are registered under the Canadian Food Inspection Agency (CFIA) and must meet minimum requirements¹³⁸, including a quality management program (QMP) and Hazard Analysis and Critical Control Points (HACCP) plan, to receive and maintain their registration.

In addition to the mandatory CFIA requirements, many producers and live shippers have achieved certification under one of the Global Food Safety Initiative (GFSI) programs. Also, if they are exporting lobster to the EU or Japan, there is a requirement to provide a catch certificate¹³⁹, demonstrating the supply source.

Discussions with producers and live shippers indicate that the existing traceability systems required under these programs provides a comprehensive means whereby product sold can be identified by supply lot, which may be identified by vessel, port, or LFA. In all cases, the product sold can be identified one step down and one step up in the distribution chain.

A practical example from a live shipper is provided:

- Live lobsters are supplied from 25 supply sources including independent buyers and transfers from other live shippers and producers.

¹³⁸ <http://www.inspection.gc.ca/food/fish-and-seafood/quality-management-program/step-by-step-guide/eng/1373564038653/1373564134350>

¹³⁹ <http://www.dfo-mpo.gc.ca/fm-gp/ccp-pcc/doc-eng.htm>

- Upon receiving, lobster is graded into one of 17 different categories based upon quality and size, reflecting individual buyer specifications.
- These 17 grades of lobster are stored in one of several tankhouses. Each tote of lobster in each tankhouse can be tracked to date of purchase, name of supplier, size and quality.
- Millions of pounds of live lobster are packed and airfreighted to niche markets annually.

This example demonstrates the complexity of traceability and how industry has successfully met the challenges of both regulators and customers. These existing traceability components should be given recognized by the MSC as a CoC equivalent as they meet the national legal requirements and as such are subject to federal audits. This existing regulatory oversight provides both identification of non-conformance and regulatory authority to act on identified non-conformance.

Risks

Given the traceability systems in place at each point of transfer the risk of co-mingling can be very low. Industry has completed a ‘Lobster Traceability Pilot Project¹⁴⁰ which identifies the existing strengths and weaknesses regarding traceability requirements. Since the completion of the project, industry and government have proceeded to develop a beta version electronic data collection system. Further, many of the large processors and live shippers have implemented custom designed traceability systems.

The following table summarizes the perceived chain of custody risk at each point of handling for Atlantic Canadian lobster.

Point of handling	Risk	Description
Harvester	Low	Normally licensed to fish only one LFA.
Small buyer	Low	Limited geographically to one or several adjacent ports. Has no holding capacity. Segregates and provides record of supply by harvester and/or port.
Large buyer	High	Buys broadly and has intermediate holding capacity. May sort by size and quality prior to placing in

¹⁴⁰ <http://lobstercouncilcanada.ca/wp-content/uploads/2011/11/Canadian-Lobster-Council-Diagnostic-2011-10-11.pdf>

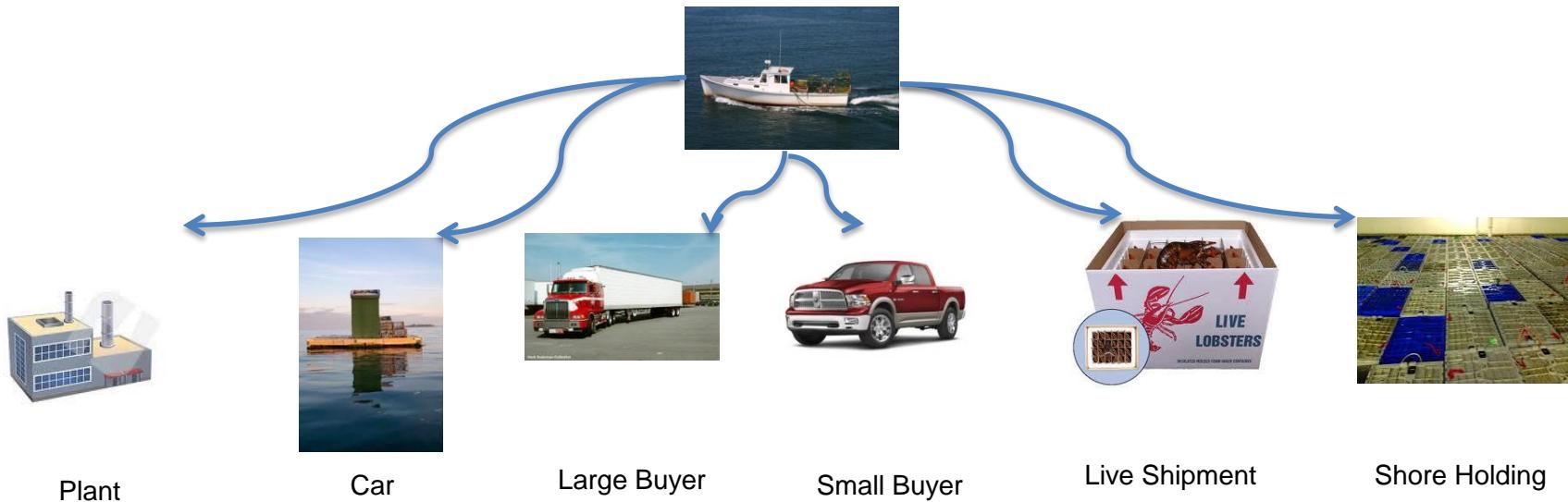
		tankhouse or reselling to producer/live shipper. The risk of mixing is particularly high if lobster is stored in bulk, not in totes, in tankhouses.
Live shipper	Mid	Buys direct and from independent buyers. Sorts and stores lobster upon arrival. Normally has a comprehensive tracking system one up and one down.
Producer	Mid	Buys direct and from independent buyers. Normally produces by receiving lot immediately upon arrival, but may tankhouse totes for live shipment, resale or future production. Normally has a comprehensive tracking system one up and one down. Can identify production lots by supplier(s).

A graphical representation of the various distribution chains to the point of sale to a wholesaler, distributor, retailer, restaurant or consumer is provided.

U.S. Supplied Lobster: Imported lobster from the state of Maine has been as high as 60m pounds in recent years, but is anticipated to reduce in future years due to an increase in processing capacity in Maine. This imported lobster is destined primarily for processing, but in some cases gets stored in tankhouses and resold into the domestic or export live markets.

Currently, the certificate holders for the Maine lobster resources are developing a sharing arrangement to permit interested Canadian producers to share in the certificate. The Maine lobster supply is normally processed outside of the traditional season, permitting easy tracking, and if imported when other Canadian supplies are available, the Maine supply is identified and segregated in order to meet regulatory requirements regarding Country Of Origin Labeling (COOL).

Harvesters have many options where their lobster goes when landed.



Plant: Many lobster harvesters land directly to processing plants to maintain high quality product.

Car: Lobster harvesters will sometimes hold product at sea, waiting on price improvements.

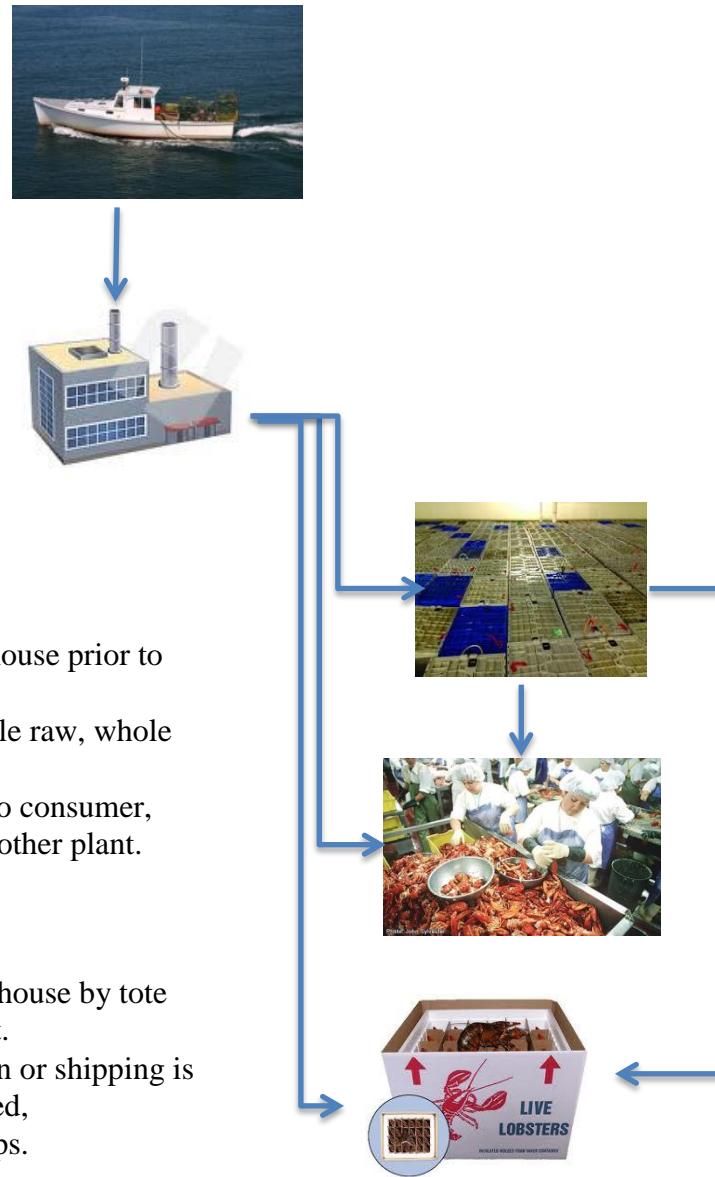
Transport: Buyers, live shippers and producers will transport lobster from several communities.

Small buyer: Most small buyers deal within a small area and resell the lobster immediately to shippers or producers.

Live shipment: Harvesters can hold buying and shipping licenses, therefore, they can direct access to the market is possible.

Shore holding: Some harvesters have shore based tank-houses where lobster is held prior to sale or live shipment.

Direct Sales to Plant



Upon arrival at the plant:

- Lobster is weighed.
- A purchase slip is completed
- Lobster may be held in tank-house prior to production or live shipping.
- Lobster is processed into whole raw, whole cooked, or meat products.
- Lobster may be shipped live to consumer, distributor, live shipper, or another plant.

Traceability:

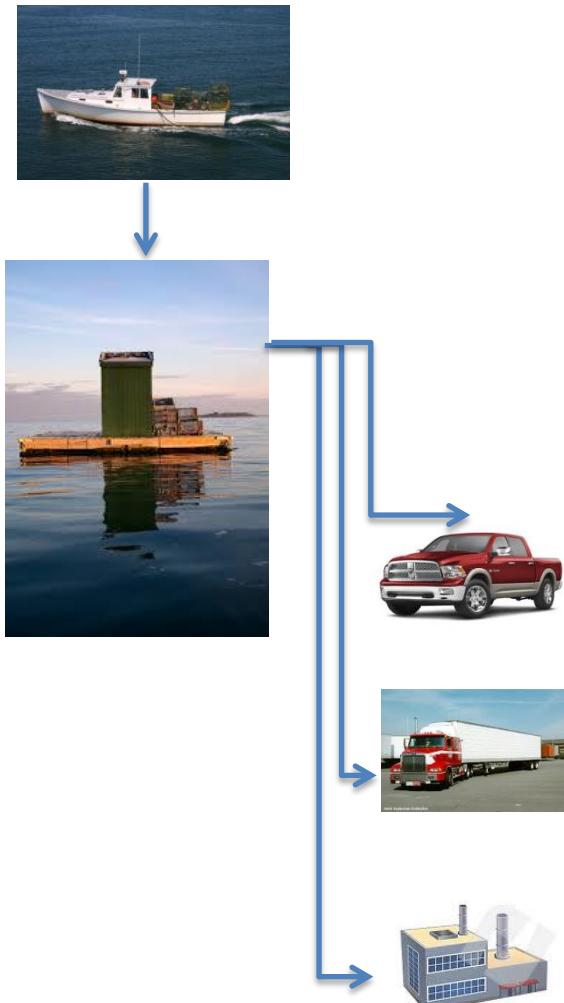
- Harvester is identified in tankhouse by tote and going directly to the plant.
- Normally supply to production or shipping is done by date lobster is received, corresponding to purchase slips.

Car Holding

Purpose: The lobster car is used to hold live lobster for short, <30 days normally, periods of time. This is either done to consolidate small quantities in remote ports until a buyer arrives, or to hold lobster until price conditions improve.

Upon arrival in port:

- Harvester may go directly to the car and place totes in the water.
- Harvester may land some lobster, generating a slip, and put the remaining lobster in



Large Buyer



Upon arrival at the port:

- Lobster is weighed at the port, generating a slip, and ownership is transferred to a buyer, shipper or plant.
- Totes are identified and segregated by harvester and port in the transport.
- Intermediate sorting and storing of live lobster in tankhouses may occur.

Upon arrival at plant:

- Lobster may be held in tank-house prior to production or live shipping.
- Lobster is processed into whole raw, whole cooked, or meat products.
- Lobster may be shipped live to consumer, distributor, live shipper, or another plant.

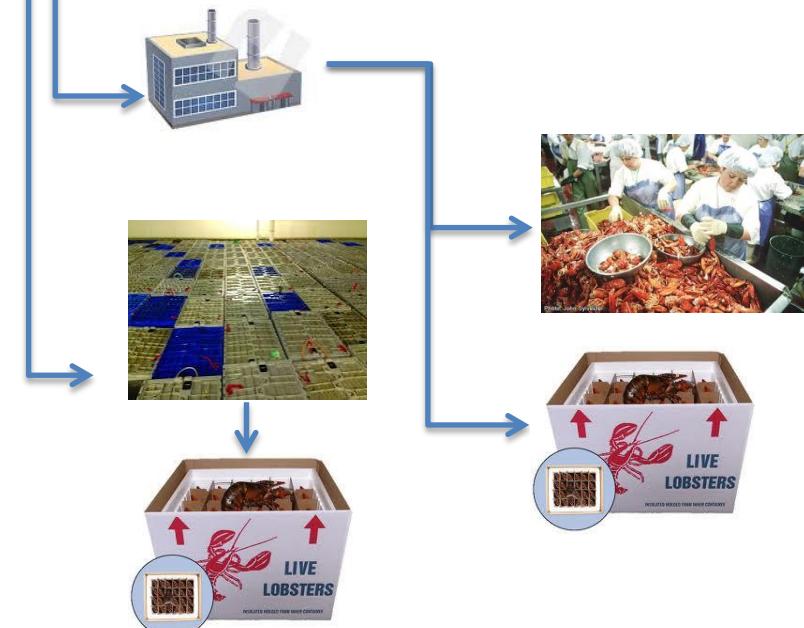
Traceability:

In transport:

1. Harvester is identified on purchase slip.
2. Tag on tote identifies harvester and/or port and date.
3. Lots by harvester or port lots may be separated by ribbons or some other means in the trailer.

At plant or live shipper:

4. Harvester and port is identified by receiving documents.
5. Lots are segregated in tank-house or going to production.
6. Live shippers may use several lots in preparation of a shipment.



Live Shipment

Upon arrival in port:

1. Harvester lands lobster, generating a sales slip to his/her own live shipping company.
2. Harvester may sell some landings or part of landings to other buyers.



When lobster is sold:

1. Lobster is shipped to a distributor, retailer, restaurant or consumer.

Traceability: The buying company has direct access to purchase slips generated at the time of sale.

Shore Holding

Purpose: A land based holding tank is used to hold live lobster for medium, 0-90 days normally, periods of time. This is either done to consolidate small quantities in or to hold lobster until price conditions improve.

Upon arrival in port:

3. Harvester will land lobster and store in tankhouse.

When lobster is sold:

2. Lobster is weighed at the tankhouse, generating a slip, and ownership is transferred to a buyer, shipper or plant.

Traceability:

3. A slip is generated when sale is made. This slip would not identify the date of capture, but would identify the harvester.
4. Local harvesters may store lobsters in the tankhouse, and harvester lots may not be identified.



Small Buyer



Upon arrival at the port:

- Lobster is weighed at the port, generating a slip, and ownership is transferred to an independent small buyer.
- Totes are identified by port and possibly slip number. Buyer normally maintains a record of slips and corresponding shipments to identify harvesters.

Resale:

- Lobster is immediately resold to either a larger buyer who will consolidate shipments for sale, directly to a plant or a live shipper.

Traceability:

In transport:

7. Tag on tote identifies port and possibly harvester.
8. Lots by harvester or port lots may be separated by ribbons or some other means in the trailer.

At plant or live shipper:

9. Harvester and/or port is identified by receiving documents.
10. Lots are segregated in tank-house or going to production.
11. Live shippers may use several lots in preparation of a shipment.



Live Holding Methods



Car



Trays



Tankhouse



Bulk Tanks

Car: A lobster car is used by a harvester to hold lobster for short periods of time, <30 days, for later sales. Different harvest days may be mixed. Sales slips are generated when the lobster are sold.

Trays: Individual lobster is stored in trays for long holding periods, up to 180 days. The lobster are identified by lot (harvester or port) and date sorted.

Tankhouse: Lobster are sold and stored in totes with ~100 pounds of lobster. When being stored the lobster may be put in tubes in the totes to reduce predation. The totes are identified by tag specifying the harvester and/or port. The lobster may be sorted by size and quality and mixed with lobster from other harvesters and ports. In sophisticated live holding operations the lots within each tote are identified so that export documents can be completed accurately.

Bulk Tanks: Lobster are sorted and stored by grade and size in bulk tanks. This is usually used for short term storage, <30 days. These tanks may be tagged with the various lots comprising the inventory.